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The Principal's Role in the Implementation of a One-to-One Initiative: A Case Study of Two Schools

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I am submitting herewith a dissertation written by Casey Michael Cutter entitled "The Principal's Role in the Implementation of a One-to-One Initiative: A Case Study of Two Schools." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Education.

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The Principal's Role in the Implementation of a One-to-One Initiative: A Case Study of Two Schools

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DEDICATION

I cannot even begin to fathom how I would have accomplished this feat without my beautiful wife, Laura Cutter. She endured five long years of me being in school, all while I was working full time. She encouraged, supported and loved me throughout the process even when I sometimes faltered as a husband and father. She helped me keep my eyes focused on what was most important and took on additional responsibilities to allow me to pursue my dream. During my journey as a doctoral student she was pregnant twice and transitioned into one of the most loving moms I have ever seen. Thank you Laura for being everything I could ask for as a husband. This accomplishment is more of a reflection of your support than it is of my intelligence or effort.

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ABSTRACT

While the popularity of one-to-one initiatives and the body of research concerning their effectiveness continues to grow, there have been few research studies conducted on how a principal leads a one-to-one initiative (Cowie, Jones & Harlow, 2011; Dexter; 2007; Hayes and Greaves, 2013). The purpose of this qualitative study was to examine how a principal can lead, support and influence the implementation of a one-to-one initiative. Stryker and Burke's (2000) role identity theory provided the theoretical framework for this multi-site case study of two intermediate schools in the same district that were in their first year of implementing a one-to-one initiative. The qualitative data collected from both sites during the study included 32 interviews, observations, documents and archival records. The qualitative data was examined through the lens of the two research questions and the role identity theory and various codes emerged during the analysis of the data. The codes were sorted into the twelve a priori roles that were identified during the literature review: visionary, digital expert, manager of resources, model of technology use, technology supporter, leader or organizational, structure and policy change, leader of change in pedagogy and learning, leader of cultural change, evaluator of technology, encourager and supporter, family and community engager and leader of ethics in technology. The role of HR Harriet or HR Harry was added to the twelve a priori roles after reviewing and coding the qualitative data. While both principals took on each of the thirteen roles at some point during the initiative, the principals' roles of visionary, leader of change in pedagogy and learning, leader of cultural change, leader of organizational, structural and policy change, encourager and supporter and model of technology use had the biggest impact on the initiative. As principals lead, support and influence teachers in the implementation of a one-to-

one initiative, they will benefit from establishing a strong vision, eliciting support from all stakeholders, and focusing on preparation to create successful one-to-one initiative change. The study developed the Principal One-to-One Leadership (POTOL) model, which illustrates how a principal can lead, influence and support the implementation of a one-to-one initiative.

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CHAPTER 1

INTRODUCTION TO THE STUDY

The implementation of educational reforms, such as Common Core Standards have motivated educational leaders to focus on increasing the rigor in the classroom, helping students apply their knowledge through higher order thinking skills, and preparing students to be college and career ready. Along with Common Core, other educational initiatives like personalized learning, learning which targets science, technology, engineering and mathematics (STEM) education, the push towards computer based state assessments, and project based learning are bringing a national focus to the integration of technology in the classroom. One way this national focus is evidenced is in the National Education Technology Plan that was developed by President Obama's administration in November 2010. The plan calls on schools to leverage the power of technology to support continuous and lifelong learning and use the technology of personal and professional lives to improve student learning (National Education Technology Plan, 2010).

This recent focus on integrating technology in the classroom is further illustrated with the increase in district spending on technology that has occurred over the last twenty years (Fishman, Marx, Blumenfeld, Krajcik, & Soloway, 2004; Hew & Brush, 2007). The recent spending statistics demonstrate that districts are looking more closely at their instructional technology initiatives and beginning to make the purchase of instructional technology a priority.

The increased investment in technology over the last ten years has helped lead to more technology in the classroom. A 2005 *Education Week* study found that the nationwide ratio of students to devices was 3.8 students to one device ("Technology Counts"). While this is a major

improvement from 125 to one in 1983 (Russell, Bebell, & Higgins, 2004), many districts have already or are currently looking to improve this ratio where students have their own technology device to utilize in the classroom. This type of initiative is called a one-to-one (1:1) initiative and is becoming more common in school districts across the United States. A *2006 eSchool News* report estimated that in the 2003 school year only 4% of the nation's school districts were implementing some variation of a one-to-one program. The same *eSchool* report approximated that just three years later in 2006, 25% of the school districts were implementing some form of a one-to-one program. By 2007, 33 states had experimented with one-to-one initiatives (Lei & Zhao, 2008).

The recent influx of spending and one-to-one initiatives is increasing the expectations placed on teachers to utilize these devices effectively. This, in effect, is increasing the importance of principals' responsibilities to effectively lead, support and influence the implementation of their school's 1:1 initiative. Numerous studies have shown that principal's instructional technology leadership correlates with a staff's integration of instructional technology (Anderson & Dexter, 2005; Chang, 2012). With research supporting the importance of instructional technology leadership, principals need more insight into how to lead, support, and influence a one-to-one initiative.

Statement of the Problem

While school technology spending has increased and the student to computer ratio has improved, research shows that actual computer usage in classrooms has remained low (Cuban, Kirkpatrick, & Peck, C, 2001; Gerard, Bowyer, & Linn, 2008). Once teachers begin to integrate instructional technology more frequently, there is a wide disparity between teachers'

technological proficiency and their ability to use instructional technology to effectively enhance student learning. Some teachers see the use of instructional technology at a more basic level, while other teachers see instructional technology as a way to deepen learning and increase critical thinking skills (Cuban et al., 2001, Hennessy, Ruthven, & Brindley, 2005). According to Flanagan and Jacobsen (2003), many teachers lack an understanding of the relationship between technology, pedagogy, and student learning. The lack of understanding between the relationships of these three areas accentuates the need for teachers to be led, supported, and influenced in their integration of technology.

The increase of school technology spending and low computer usage in the classrooms has potentially impacted the fact that most research studies choose to focus on teachers and students and how they can utilize instructional technology more effectively in the classroom, rather than focus on the principal. While much of the research has been about how teachers and students can more adequately employ instructional technology, there have been some studies conducted on the principal's role in leading, influencing, and supporting technology usage in their school (Afshari, Bakar, Luan, Samah & Fooi 2009; Anderson & Dexter, 2000, 2005; Byrom & Bingham, 2001; Chang, 2012; Flanagan & Jacobsen, 2003; McGarr & Kearney, 2009; Shapley, Sheehan, Maloney and Walker, 2010). However, there have been only a few research studies conducted on how a principal leads a 1:1 initiative (Cowie, Jones & Harlow, 2011; Dexter, 2007; Hayes and Greaves, 2013) and very little research conducted on how a principal specifically leads, supports, and influences the use of instructional technology in the implementation of a one-to-one initiative. While there have been various studies that support the importance of instructional technology leadership and clear statistics that cite an increase in one-

to-one initiatives, findings from a closer study of how a principal leads, supports and influences the implementation of a one-to-one initiative will add to the literature in instructional technology.

Purpose of the Study

The purpose of this qualitative multi-site case study was to examine how a principal can lead, support and influence the implementation of a one-to-one initiative. The objective of the study was also to explore how a principal's leadership can foster or hinder the effective use of instructional technology to enhance student learning in the implementation of a one-to-one initiative. The final goal of the study was to examine the teachers' perceptions of a principal's efforts to lead, support, and influence the implementation of a one-to-one initiative and compare these perceptions to the principal's own perceptions of the efforts.

Research Questions

The study design was an exploratory multi-site case study to examine how a principal can lead, support and influence the implementation of a one-to-one initiative. The study was guided by the following two tiered questions:

1. How do principals lead teachers in the implementation of a one-to-one initiative?
    a. How do principals support teachers in the implementation of a one-to-one initiative?
    b. How do principals influence teachers' use of technology in the implementation of a one-to-one initiative?
2. How do teachers perceive the principal's efforts to lead, support, and influence the teaching staff in the implementation of a one-to-one initiative?

Definition of the Terms

To fully understand the study, the following terms must be clearly defined for the reader:

1. *Instructional Technology or Educational Technology:* Seels and Richey's (1994) attempted to define instructional technology by calling this the theory and practice of design, development, utilization, management and evaluation of processes and resources for learning" (p.1). Although the definition has not been conceptually reconfigured and agreed upon, the constant influx of new technologies has evolved the definition (Ely, 2008). Ely mentions that the terms educational technology and instructional technology are used interchangeably in the literature. The term Information and Communication Technologies (ICT) is also used regularly in instructional technology studies outside the United States. For the purposes of this study, the term instructional technology will be used to indicate educational technology and ICT.
2. *Twenty-First Century Learning*: The definition of twenty-first century learning is open to interpretation, but in this study twenty first century learning encompasses learning that utilizes skills that will be used more commonly in the twenty first century. Examples of twenty first century learning skills are critical thinking skills, problem solving skills, collaboration, and digital literacy that experts believe students need to learn in today's society (How Do You Define 21st-Century Learning, 2010).
3. *One-to-One Initiative (1:1):* One-to-one initiatives "seek to provide laptop computers or tablets (devices) and Internet access to students for use at school or at home" (Penuel, 2006, p. 329). The purpose is for the devices to supplement the regular classroom learning (Hatakka, Andersson, & Grönlund, 2013)

Delimitations

This study was delimited to two East Tennessee schools within the same district that implemented one-to-one initiatives. This choice meant that the study was bounded, and only investigated schools within one southeastern state. The decision to delimit the sample to two intermediate schools, limited the school districts that could be chosen because there were fewer school districts implementing 1:1 initiatives across multiple school levels. The choice to study two intermediate schools also meant that the implementation of one-to-one technology would be studied in the fourth, fifth, sixth and seventh grades. Intermediate schools are less common than traditional elementary and middle schools and thus it is more difficult to generalize the findings to elementary and middle schools. Any generalization of the findings to other states and to the high school level should be approached with caution.

The selection of two schools from within one school district further delimits this study. Two schools from the same school district were chosen to ensure that the schools have the same implementation plan, thus allowing the researcher to more closely control the outside factors and look more specifically at school leadership differences. The qualitative study also focused only on the responses of principals, assistant principals, technology coordinators, technology support teachers and teachers. Perceptions of other stakeholders were not included.

Limitations

This study was limited by self-reported data from principals, assistant principals, technology coordinators, technology support teachers and teachers through interviews, observations, documents and archival records. Findings from this study may be limited because some respondents may not have answered their interview questions honestly for a variety of

reasons. This is particularly a concern when interviewing principals because they may have the tendency to polish their answers and embellish levels of support. The decision to conduct a fully qualitative case study was potentially a limitation, but was addressed through triangulation, member checks, the use of a clear case study protocol, and the creation of a detailed case study database. Another limitation was that the researcher who collected the data was an assistant principal employed in Knoxville, Tennessee at a school that was implementing a one-to-one initiative in grades two, three, four and five. The question of bias is addressed in Chapter Three, Role of the Researcher.

Significance of the Study

With the current state of educational reform, the implementation of instructional technology is becoming a bigger part of many districts' future plans. More districts are taking the integration of technology a step further and providing a personal device for each student. Districts are investing billions of dollars into these initiatives in hopes that they will help increase student achievement.

Literature in school leadership indicates that a principal is responsible for leading a school in the integration of instructional technology and plays an essential role in helping the school use technology to impact student learning (Dawson & Rakes, 2003; Yee, 2000; International Society for Technology in Education, 2009; Schiller, 2003). There is research on the teacher's role in the implementation of a one-to-one initiative, and while there is research that a principal *should* lead and support technology initiatives, there is very little research on *how* a principal can lead, support and influence the implementation of a one-to-one initiative. Research on a principal's leadership of a one-to-one initiative could benefit various stakeholders. Policy

makers could use the study findings to guide policy changes or future financial decisions to better help districts, principals and teachers who are involved with one-to-one initiatives. District leaders can garner information from the study findings on what principals will be most effective in leading a one-to-one initiative, what roles principals need to play in order to lead a one-to-one initiative and what type of training districts need to provide their principals to effectively lead a school in a 1:1 initiative. School leaders will learn from other principals' experiences and preview any setbacks they may encounter in their own implementation from this research's findings. Teachers can become more informed on what type of leadership and support can help them with implementing instructional technology. Policy makers, district leaders, principals and teachers can all benefit from the findings of this study and learn from the experiences of principals that will help them in their own one-to-one initiatives.

Organization of the Study

Chapter 1 briefly described the recent influx of technology in the classroom and the one-to-one proliferation that has occurred across the country. The chapter detailed the research study and the statement of the problem, purpose of the study, and research questions that the study posed. The chapter defined the terms instructional technology, educational technology, twenty first century learning and one-to-one initiative. The chapter concluded with an explanation of the limitations, delimitations and significance of the study.

Chapter 2 will seek to provide some background information on instructional technology and one-to-one initiatives and discuss the current state of both topics. The chapter further discusses one-to-one initiatives and both their positive and negative impacts on instruction and student learning. A summary of the research concerning school principals' leadership of

instructional technology is outlined including the roles principals adopt in the leadership of instructional technology and the various support systems that are needed in order for a school to implement instructional technology. The identity theory is defined and there is an explanation of how the theoretical framework serves as a guide for the collection, analysis and interpretation of the data in this study.

Chapter 3 describes the methodology and design of this exploratory multi-site case study involving two schools. The chapter specifically focuses on the case study approach, the rationale behind it and the role the researcher plays in the study. The sites and participants are depicted as well as how the researcher approached the sites and the data collection procedures that were employed. The chapter also outlines how the researcher analyzed the data that was collected and how this data was verified.

Since the study is a multi-site case study, the research study will analyze the two sites separately as within-case analyses and then discuss the cross-case findings of the data. In chapter 4, the researcher will analyze the data and answer the research questions for both intermediate schools. Chapter 4 will include thick, rich and descriptive data, which is a strength of case study research (Merriam, 2009). The end of Chapter 4 will share cross-case findings of the two schools and discuss the various roles the principal adopts at each school and their similarities and differences. The cross case analysis is included because it can help make the case study research more robust and compelling (Herriott & Firestone, 1983).

Chapter 5 concludes the research study with a discussion of the findings, implications of the study and recommendations for future research on one-to-one initiatives. The implications will focus specifically on providing information to districts and school principals' currently

implementing one-to-one initiatives and districts and school principals who plan on implementing a one-to-one initiative in the future. Suggestions and recommendations for future research will be made that align with the research study's findings. The study finishes with the researcher's closing thoughts and reflections.

CHAPTER 2

REVIEW OF THE LITERATURE

To understand how a school principal leads, supports, and influences the implementation of a 1:1 initiative, a review of the current research on the topic of instructional technology is necessary for understanding the state of the field. The review of literature in this chapter will first focus on providing an overview of instructional technology in schools and discuss the current state of instructional technology. The review will then explore the increasingly popular idea of one-to-one initiatives and the historical evolution of these initiatives, share literature explaining why they have grown in popularity, outline the fundamental tenets of 1:1 initiatives, review the impact these initiatives have on instruction and students and relay the negative aspects of 1:1 initiatives found in research. Finally, the topic of principal leadership and instructional technology, the roles principals play in the leadership of instructional technology, and the support systems needed for both teachers and principals to implement instructional technology will be discussed. The literature review concludes with a discussion of the theoretical framework that will serve as the lens for data analysis.

The literature review was compiled through a search of multiple electronic sources. The majority of these electronic sources were accessed through the University of Tennessee's online library site under the subject Education. The list of electronic sources searched were Education Week, Education Source, ERIC, the International Society for Technology in Education site, Google Scholar, Sage, and the US Department of Education Site. Search items included *instructional technology, information and communications technology (ICT), technology in the classroom, educational technology, instructional technology spending, one-to-one initiatives,*

laptop initiatives, implementation of one-to-one initiatives, one-to-one initiatives and student achievement, principal leadership of instructional technology, principal leadership of one-to-one initiatives, and principal leadership of the implementation of one-to-one initiatives. The majority of the research found was qualitative, but some quantitative, mixed method, research syntheses and online articles were included in this review.

Instructional Technology in Schools

Personal computers were introduced to the world in the 1980s. Not long after this introduction, personal computers were introduced to schools and studies were conducted to measure the impact on students (Davies, 2010). Reactions were generally mixed at the time when personal computers were introduced to computer labs and classrooms. When schools could afford a large number of computers in the 1980s and early 1990s, the computers frequently were placed in centrally located computer labs in the school (Means & Olson, 1995). The problem was that when computers were located in labs, they were rarely used for instructional purposes because of the logistics involved in getting students there and the difficulty of scheduling an open time in the computer lab (Adelman, Donnelly, Dove, Tiffany-Morales, Wayne, & Zucker, 2002). Kozma's argument (1991) was that students needed to be able to use computers more than once or twice a week to make a significant impact on student learning. Some researchers found that most teachers don't utilize instructional technology with students enough because of this limited access (Adelman et al., 2002; Sheingold & Hadley, 1990). The proliferation of instructional technology use in schools has been further encouraged through different federal programs like No Child Left Behind, which sought to leverage technology to impact teaching and learning (No Child Left Behind [NCLB], 2001). The National Education

Technology Plan (US Department of Education) was introduced in 2010, which encouraged schools to use the technology of personal and professional lives to improve student learning.

Since the introduction of technology to education, some have felt that technology integration has been uneven at best and even nonexistent in some places (Ginsberg & McCormick, 1998). There have been some excellent examples of technology integration in the classroom, but overall, the implementation of new technology into schools has not changed the face of public education. Currently, computers in the classroom primarily have been used to support much of the same traditional teacher centered, lecture approach. In a study conducted by Ginsberg and McCormick (1998), data were collected from 1,163 teachers in a mixture of highly effective and less effective 19 southeastern schools. Both highly effective and less effective schools in the Ginsberg and McCormick study reported using the computers mostly for word processing skills and the computers were very rarely integrated into learning activities. However, some believe this may change because of the increased focus on providing more computers in the classroom.

The Current State of Instructional Technology

Before the recent increase in focus on technology integration, schools have lacked sufficient funds to acquire the technological equipment that they desired. Education has always faced financial barriers, but many administrators still lament inadequate technology resources (Banoğlu, 2011). There is fierce competition for resources at the school level and technology is often seen as nonessential (Fishman et al., 2004).

While the priority of technology spending has varied in the past, recent spending has made a case that there is an increased focus on instructional technology (Compass Intelligence,

as cited in Dexter, 2011; Fishman et al., 2004; Quality Education Data as cited in Hew & Brush, 2007, p. 224). In fact according to Bebell and Kay (2010) "few modern educational initiatives have been as widespread, dramatic and costly as the integration of computer technologies into American classrooms" (p. 5). Singapore launched their first nationwide plan to adopt more technology in the classroom in 1997 and spent $1.2 billion (Hew & Brush, 2007). According to Quality Education Data (as cited in Hew & Brush, 2007), districts in the United States spent $7.87 billion in technology equipment in the 2003-2004 year. Compass Intelligence, as cited in Dexter (2011), reported that schools in the year 2009 invested heavily in instructional technology and spent an estimated $7.6 billion on technology hardware and software. Based on the increase in spending, an excellent case can be made that we are headed into a vastly different looking future in the educational world of technology integration (Dexter, 2011; Education Week, 2005; Hew & Brush, 2007).

Despite the increase in funds for instructional technology, barriers still exist for the use of technology in the classroom. Some of the barriers include: equipment problems, pedagogical issues, teachers who lack technological capacity and inadequate professional development to help teachers (Flanagan & Jacobsen, 2003).

Sometimes educators have difficulty integrating technology in the classroom because computers and equipment available to teachers are often outdated or the equipment resides in the computer lab instead of the classroom. Further, many teachers lack the understanding of the relationship between technology, pedagogy and student learning (Flanagan & Jacobsen, 2003). Some teachers simply do not have the skills necessary to operate technology themselves, which exponentially increases in a classroom environment. This is why one study of a laptop initiative

found that teachers with more advanced technology skills used their laptops in class 20% to 30% more often than their peers (Silvernail & Lane, 2004). The wide disparity of teacher technology proficiency adds to the difficulty of being able to support each teacher and individual technology needs. However, if teachers lack technology capacity, then professional development is needed for them to appropriately implement technology in their classrooms. Funding limits the extent of professional development that is available and most of the training tends to focus on acquiring skills, rather than building technology integration strategies (Flanagan & Jacobsen, 2003).

In one study by Cuban, Kirkpatrick and Peck (2001), two highly technical high schools with about 1,900 students were studied in the Silicon Valley of California. The two schools were fairly affluent, with the students having greater access to computers at home than the national average. The faculty and students at these two high schools were given greater access to computers and software at school than in previous school years. This greater access meant that there were more computers available in each classroom for the students to use, as well as greater Internet connectivity. Even though the students had greater access to technology, there was still a very low use of the technology by teachers and students (Cuban et al., 2001). The study ultimately found that greater access to technology rarely led to greater student and teacher use. Another study focused on secondary science teachers found that only 17% of science teachers used computers consistently in the classroom (Gerard, Bowyer, & Lynn, 2008). Some teachers still see technology as a separate course, rather than tools that are integrated across the curriculum on a daily basis (Flanagan & Jacobsen, 2003). In fact, if teachers don't see that the expected uses of technology align with their curriculum, then they may be likely to use it less often (Valiente, 2010).

Educators seem to have a broad interpretation of the phrase "technology integration." Technology integration generally refers to how an educator uses technology in the classroom. This means that less technical teachers see technology integration as students using computers to conduct internet searches, while more technical educators interpret technology integration as a tool for project based learning and multimedia projects (Cuban et al., 2001). Teachers who possess technological skills see instructional technology as a vessel to develop students' thinking skills, while others have a more basic view, seeing technology integration as a way to work on assignments in class more reliably and productively (Hennessy, Ruthven & Brindley, 2005). Overall, most teachers in today's classrooms are currently in an "adaptation stage" of technology adoption (Valiente, 2010). According to Valiente, "they are adapting traditional teaching strategies to incorporate more adult productivity tools and are having students work independently and in small groups, but they have not yet begun to widely implement more student-centered strategies for instruction" (p. 12).

Across the literature, educators see the meaning of technology integration differently based on their technological literacy. Educators are currently encouraged to focus on technological literacy and develop their technology capacity to change the way they teach. According to Chang's study (2012), a teacher's technological literacy can improve teacher effectiveness. In his study, he surveyed 1,000 Taiwanese teachers and used a Cronbach's Alpha to determine correlation between a teacher's technological literacy and teacher effectiveness.

The successful use of technology can positively affect teaching because instructional technology not only engages students, but also allows students to have authentic learning experiences (Flanagan & Jacobsen, 2003). This new approach allows students to acquire the

skills necessary to function in this ever-changing digital world. Zucker and Light (2009) mention that technology is often seen as one of the keys to meeting the deep demand for educational reforms in developing countries and transforming education systems. The new learning environments that utilize technology can change the role of teachers and students, as we know them. As teachers shift to a coaching role, the students' culture changes from competitiveness to cooperative learning, whole group changes to small group, and teachers work more closely with struggling students (Collins, 1991). Learning becomes more about the student and increases the student's accountability for learning (Thomas & Knezek, 1991). In an observational study by Cohen (1997), technology rich classrooms made learning more natural, connections between students deeper, and social interactions between teachers and students more comfortable. The use of instructional technology can help a teacher change from the disseminator of knowledge to a wise mentor (Flanagan & Jacobsen, 2003). Overall, the classroom can become more inquiry oriented (Gerard et al., 2008).

Veteran teachers sometimes have less interest in implementing technology, but a story told by Flanagan and Jacobsen gives hope (2003). These researchers discussed a teacher who initially dreaded integrating technology in the classroom. The teacher called it "teaching computer class" time and her teaching confidence was shaken by the administrations' new expectation of integrating technology. However, after a few small steps towards using technology in the classroom, the teacher built efficacy and became a strong proponent for the integration of technology. Flanagan and Jacobsen's story makes an excellent point, that with the right support and leadership, anyone can implement technology in the classroom.

One-to-One Initiatives

A Historical Look at 1:1 Initiatives

Many believe that for the effects of technology integration to have the greatest impact, schools and districts need go beyond providing additional instructional technology and make a commitment to provide each student with his or her own device (Bebell and Kay, 2010; Bull, Bull, Garafolo, & Harris, 2002; Rockman, Chessler & Walker, 1998). These initiatives are called one-to-one initiatives (1:1 initiatives) and provide a computer for every student and teacher. One-to-one initiatives can offer many benefits in comparison to the traditional use of instructional technology and also can lead to increased student test scores (Bebell, & Kay, 2010; Dunleavy & Heinecke, 2008; Dwyer, 1994; Fadel & Lemke, 2006; Grimes and Warschauer, 2008; Gulek & Demirtas 2005; Hayes and Greaves, 2013; Jeroski, 2003; Lowther, Ross & Morrison, 2003; Mouza, 2008; Rosen & Manny-Ikan, 2011;Schwarz, 2012; Shapley et al., 2010; Silvernail, 2008; Suhr, Hernandez, Grimes & Warschauer, 2010). While 1:1 initiatives can affect schools in many positive ways, they can also lead to many challenges and leave many unanswered questions that evoke additional research.

While computers were introduced to some classrooms in the early 1980s, the earliest 1:1 initiatives did not begin until the mid-1980s and provided students with desktop computers or laptops with no capability to access the Internet (Penuel, 2006). The first documented 1:1 initiative was the Apple Classrooms of Tomorrow (ACOT) Initiative that began in 1986. The program was launched at a time where there was great deal of excitement and potential for technology to enhance learning (Dwyer, 1994). The program began in seven classrooms and each student and teacher was given a computer to use at school and a computer to use at home.

According to Dwyer (1994), "since hardware in 1986 was big and heavy, the two computer formula was the only way to stimulate a time when students and teachers would have constant access to technology by virtue of some future state of miniaturization, portability and cost" (p. 1). Another earlier reported 1:1 experiment was in 1989 in Melbourne, Australia at the Methodist Ladies College. The college required all incoming students in grades five through twelve to purchase a school approved Toshiba laptop. Other Australian schools duplicated these efforts and by the late 1990s it was reported that over 50,000 Australian students had their own laptop computer for school (Stager, 1998).

There were numerous schools in the United States that experimented with 1:1 initiatives in the 1990s. Sometimes these programs were funded through private tuition (Thompson, 2001), fundraisers (Stevenson, 1999) or local foundations and grants (Cromwell, 1999). One of the earliest highly visible 1:1 initiatives in the United States in the mid-1990s was Microsoft's Anytime, Anywhere Learning program. This initiative allowed schools and districts to implement programs that enabled students to either lease or purchase laptop computers that they were expected to use at school (Penuel, 2006). This made Microsoft one of the first companies to experiment with and support the 1:1 direction (Rockman et al., 1998). These initiatives slowly grew from the 1990s to the early 2000s and it was estimated that 4% of districts were implementing one-to-one initiatives during the 2003-2004 school year. These numbers skyrocketed during the next three years and in 2006 it was predicted that near 25% of school districts were implementing some form of a 1:1 program (eSchool News, 2006).

Some of the states that implemented large-scale initiatives in 2006 were California, Florida, Georgia, Kansas, Louisiana, Maine, Pennsylvania, Texas and Virginia. Maine's

Learning and Technology Initiative (MLTI) has been one of the highest profile 1:1 efforts. In 2006 the statewide Pennsylvania's Classrooms for the Future program provided class sets of laptops to more than 500,000 high school students (Zucker & Light, 2009). Henrico County school district in Virginia was a large 1:1 district initiative in the early 2000s that initially focused on high school students and expanded to 23,000 students by 2003 (Gulek & Demirtas, 2005). In 2006 a national survey of school district chief technology officers reported that 50% of them were likely to purchase a computing device for each student in their district by 2011 (Hayes, 2006). By 2007, Lei, Conway and Zhao claimed that at least 33 states were implementing some form of a 1:1 initiative and many more were strongly considering implementing a 1:1 initiative in the future. This phenomenon has grown interest beyond the United States with 1:1 initiatives implemented in numerous countries including, but not limited to, New Zealand (Cowie, Jones, Harlow, Forret, McGee & Miller, 2008), Singapore (Hew & Brush, 2007), France (Jaillet, 2004), Australia (Newhouse & Rennie, 2001), Canada (Sclater, Sicoly, Abrami & Wade, 2006), Portugal (Valiente, 2010), Chile, Columbia, Libya, Mongolia, Nigeria, South Africa, Uruguay, Venezuela (Zucker & Light, 2009). Portugal provided 500,000 computers to students and Uruguay has distributed 120,000 laptops and plans to purchase 300,000 more and Venezuela recently ordered one million laptops for students (Zucker & Light, 2009). One-to-one initiatives are now found across the globe and they can involve anywhere from twenty to over one million devices.

Some researchers like Holcomb (2009) believe that few educational initiatives have been as costly as modern day 1:1 initiatives. The recent lowered cost of learning devices has helped make bigger scale initiatives more practical for schools, districts and states (Valiente, 2010).

However, the cost of 1:1 programs can vary based on the depth and breadth of the program. In 2001, Maine launched the first statewide 1:1 initiative, Maine's Learning and Technology Initiative (MLTI), in the United States in grades seven and eight, costing the state close to $120 million. Australia recently committed $1.2 billion for their school technology program (Zucker & Light, 2009). Even the cost for non 1:1 programs like the E-rate program, that have worked to connect almost all schools to the Internet, are extremely expensive and have cost the US about $20 billion since the year 1998 (Zucker & Light, 2009). Even though costs have lowered over time for 1:1 initiatives, the cost to implement a 1:1 initiative is still relatively expensive.

The cost of a 1:1 initiative goes beyond the initial cost of the devices. "The initial hardware purchase of a 1:1 initiative only represents about a third of the total cost in a developing nation, whereas training, service and technical support account for more than half of the total cost" (Zucker & Light, 2009, p. 84). Schools should look closely at the total cost of ownership (TCO) when implementing a 1:1 initiative. The TCO can include "training of teachers, technical support, software, replacements costs of aging equipment and other items" (Zucker & Light, 2009, p. 84).

One-to-One Versus Sharing Computers

With the continued increase in popularity of computers in the classroom and the overall decreased costs of computers, the ratio of students to computer devices in the classroom has lowered substantially. This computer ratio has become the widespread measurement tool of students' access to computers in schools and thus educational leaders have tried to gradually reduce student to computer ratios. The ratio of computers to students in the classroom in 1983 was 125 students to one device (Russell, Bebell, & Higgins, 2004). This ratio continued to

decrease to 9 to 1 in 1995, to 6 to 1 in 1998, and finally to 3.8 to 1 in 2005 ("Technology Counts", 2005).

Even though student to computer ratios have improved, computers still have to be shared by students. Students often have both access to computers in their classrooms as well as access to computer labs, but teachers can be discouraged from using technology more regularly due to the challenges of scheduling shared computer labs or mobile carts. Russell, Bebell and Higgins (2004) conducted a study in one school to compare classrooms that had one device per student to classrooms that had a shared laptop environment with access to mobile labs, an environment with either four-to-one or two-to-one student-computer ratios. The researchers observed both types of classrooms and studied how both teachers and students used the computers in the classroom. The study conducted 56 observations of both 1:1 and shared computer classrooms for two months. The researchers found significant differences with the two-to-one and four-to-one computer ratios resulting in relatively limited student use compared to the one-to-one classrooms. Overall, the study found that technology use for a variety of academic purposes increased significantly when full versus shared access to computers was provided. Bebell and Kay (2010) contended, "Both proponents and opponents of instructional technology agree that the full effects of computers in school cannot be fully realized until the technology is no longer a shared resource" (p. 6). Ultimately, many observers theorize that the dramatic increase in the student to computer ratios in schools and relatively stagnant extent of student use is because the technology has not reached a stage where it is ubiquitous (Bull et al., 2002; Rockman et al., 1998, Cuban, 2006).

Studies of 1:1 initiatives regularly report that students in these programs use computers more often and for a wider variety of purposes than students who have less ubiquitous access to computers (Bebell & O'Dwyer, 2010; Jaillet, 2004; Lowther et al., 2003; Russell, et al., 2004). While this finding is not surprising, "the magnitude of the difference in technology use" between 1:1 classrooms and non-1:1 classrooms in the Russell, Bebell and Higgins study (2004) was dramatic (p. 9). Shared classroom students either reported using computers "15 minutes or less" or "15 to 60 minutes" a day. One-to-one classroom students reported that they used the technology between "1-2 hours" or "2 or more hours" a day. At one point of the study, the observers recorded a classroom that involved technology on average 33 times per observation in the 1:1 classrooms compared to fewer than five times per observation in the shared computer classrooms.

Fundamental Tenets of 1:1 Initiatives

In looking at the growth in the United States and beyond, 1:1 initiatives are here to stay and will continue to grow. Given that, the fundamental tenets of these initiatives must be fully understood Andrew Zucker (2004) argues that there are four critical features of 1:1 initiatives. The four critical features are: the nature of the technology used, the nature of the setting, the nature of the implementation plan and the nature of the goals and objectives.

One of the core tenets of 1:1 initiatives evidenced in research is the type of technology used. One-to-one initiatives revolve around the idea of each student having their very own device, but the type of device used is a critical component of the plan. Schools have been most likely to choose laptops in the past, but the introduction of tablets and other computing solutions has made the decision of which technological device to implement more difficult. In order to

make a wise decision, schools wishing to implement 1:1 initiatives must contemplate the overall cost of the devices, the features of the particular devices they are considering, and what they plan to use the devices for. Tablets have lowered the price of 1:1 initiatives, but tablets do not offer the same functionality as traditional laptops. Google Chromebooks are a new type of laptop that is significantly cheaper, but they have limited local storage. These laptops save everything to Internet cloud solutions and don't operate off of traditional Windows software. Cloud solutions allow users to save documents and multimedia files to the Internet, so that they do not take up local storage space on their computer. The choice of devices greatly affects the overall 1:1 initiative and is a core piece of every successful 1:1 initiative, but the nature of the technology used also addresses what is on the computers and the technological infrastructure within the schools. William Penuel's (2006) synthesis of 1:1 research falls into Zucker's first fundamental tenet, the nature of the technology used. He found three common characteristics of one-to-one computing in the classroom. These three characteristics were: 1) providing students with the use of portable laptop computers loaded with contemporary productivity software (e.g., word processing tools, spreadsheet tools etc.) 2) enabling the students to access the Internet through schools' wireless networks, and 3) a focus on laptops to help complete academic tasks such as homework assignments, tests and presentations" (p. 331).

The setting of the 1:1 initiative is another common component of a 1:1 initiative found in research. The setting refers to where the initiative occurs such as the state, school district or school. Does one school adopt the initiative or does the entire district adopt it? The W.L. Parks Middle School in Atlanta was an example of a school-wide initiative that resulted in double-digit test score gains in just a few years (Robinson, 2003). The Henrico County school district in

Virginia mentioned previously was an example of a district wide initiative that aimed at providing devices for all high school students. As mentioned above, the Maine Learning and Technology Initiative (MLTI) was the very first statewide initiative that provided all seventh and eighth grade students and teachers with computers. Each setting may have unique demographics, political climates or characteristics (i.e. assessments or state standards) that affect the overall initiative (Zucker, 2004).

Research on one-to-one initiatives has shown that these initiatives are not as simple as handing out a device to every student. Zucker and Light (2009) claim that the "policy-makers and the public need to be clear about the educational and social goals for laptop programs (which will vary according to local needs and aims) and assure that the necessary elements are in place to reach those goals" (p. 84). Most initiatives have some form of an implementation plan to help the initiative to be successful. This can be anything from whether or not students take home their devices (Penuel, 2006) to whether professional development for integrating technology is an important component of the initiative and if it is, how is it done (Zucker, 2004).

The goals and objectives can vary with each initiative, but every initiative has some sort of goal or objective that drives their program. "Setting the implementation goals facilitates self-evaluation by teachers and schools, and it helps identify what kind of support is necessary to develop all the innovative potential of the reforms" (Valiente, 2010, p. 8).

Some states have the goal of eliminating the "digital divide" in their state. The "digital divide" refers to the fact that students with low-income minority backgrounds often encounter poor access to technology (Donahue, Finnegan, Lutkus, Allen, & Campbell, 2001). Reports have found that low-income and minority households are the least likely to be online. In fact

2013 studies found that only 63% of low income households, 70% of African American households and 63% of Hispanic low-income households had access to the Internet at home compared to 79% of white households (Zickuhr, 2013). Fulton and Sibley (2003) compared the impact of a student not having access to computers influencing a student's technology literacy readiness to how a student not having books affects the student's reading readiness. Rosen and Manny-Ikan (2011) claimed that bringing a 1:1 computing environment to low socioeconomic students can bridge the social gap and narrow the digital divide. These initiatives believe that entrusting each student with a device allows the student to have access to the Internet and their schoolwork at all times, thus opening a whole new world of accessible learning. This focus on closing the digital divide has been a goal of districts like Henrico County, Virginia and the main reason why they adopted 1:1 initiatives.

Other initiatives focus on the broader picture and have the goal of increasing their state's economic competitiveness. This goal has particularly caught the eye of numerous political leaders who have claimed that providing students access to powerful computing devices can significantly contribute to state's economic prosperity in the long term (Bebell & Kay, 2010). The Maine Learning and Technology Initiative was a great example of this and the then Governor of Maine, Angus King, set this goal because their state had historically had a very small technology industry (Zucker, 2004). The idea was that by infusing technology in schools, students would be better prepared for a future workplace that is filled with technology.

When developed and developing countries create 1:1 programs, it is common for them to set the goal of providing students with technology based skills and competencies (Kozma, Quellmalz, & Zalles, 2004; Penuel, 2006; Valiente, 2010; Zucker & Light, 2009). An example

of this, is when the World Bank Institute started the World Links program in 2000 which supports 26 developing countries around the world in establishing global, online communities for secondary school students and teachers. One of the ultimate goals of their program was to improve the technological and information skills of students (Kozma et al., 2004).

Finally, the most common goal and objective of a 1:1 initiative is to initiate a transformation in the quality of instruction to improve educational practices and academic achievement (Valiente, 2010). In this day and age, the power of standardized testing cannot be ignored. Right or wrong, schools are judged by the quality of their test scores and the main goal of a 1:1 initiative as in any educational reform is to improve a school's student achievement by integrating technology, pedagogy and content knowledge. Some 1:1 goals may seem altruistic, but politicians and school leaders ultimately want to see school growth data that supports the millions of dollars of investments 1:1 initiatives require.

The Impact of the 1:1 Model on Instruction

In many districts, computers in 1:1 initiatives seek to become "cognitive tools that are holistically integrated into the teaching and learning processes of their school (Weston & Bain, 2010). One-to-one advocates believe 1:1 programs are preferred over other models because the devices can be used as a tool to help transform teaching and instruction. By giving students ubiquitous access to devices, these initiatives have the potential to transform learning environments (Penuel, 2006). In fact in Bebell and O'Dwyer's (2010) research synthesis, nearly all of the authors they reviewed made note of the massive potential 1:1 initiatives have in transforming education. Rosen and Manny-Ikan (2011) argued that the goal for 1:1 initiatives should be, "to use a technological learning environment as a mechanism for paradigmatic change

of learning, teaching and promoting new abilities and skills needed in the information age" (p. 151). Essentially 1:1 initiatives should become less about the device and more about the opportunities they open.

In a study of five 1:1 pilot middle schools in western Massachusetts (Bebell & Kay, 2010), 80% of pilot teachers noted that the delivery of their instruction and curriculum had changed since the start of their 1:1 program. In the Russell, Bebell and Higgins comparison study (2004) between 1:1 and shared classrooms, shared classroom teachers were nearly two times more likely to be teaching in a whole group format than the 1:1 classroom teachers. One-to-one initiatives helped teachers to spend less time lecturing (Gulek & Demirtas, 2005). One-to-one initiatives are a preferred model because they allow teachers to shift their traditional ways of teaching and become more facilitators of learning (Mouza, 2008). This shift to facilitator means that a positive outcome of 1:1 initiatives is that classrooms become more student centered (Dunleavy, Dexter & Heinecke, 2007; Lowther et al., 2003; Rockman et al., 1998).

Teachers were also able to use the devices to provide students with instant feedback in class which allowed for more targeted remediation (Russell et al., 2004). Teachers could more effectively utilize formative assessments to measure each student's understanding and therefore, design learning activities that were more individualized (Dunleavy et al., 2007).

Not only does having a device for every student make learning potentially more student centered, it also encourages the development of more critical thinking and problem solving skills (Gulek & Demirtas, 2005; Lowther et al., 2003; Rockman et al., 1998). This can occur in 1:1 programs because the instruction often shifts to a more project based learning approach, which causes the students to have to problem solve, think critically and regularly find information,

make sense of it and communicate it (Rockman et al., 1998). Even one of the earliest studies of a 1:1 program Apple Classrooms of Technology (Dwyer, 1994), found that "the greatest student advances occurred in classes where teachers were beginning to achieve a balance between the appropriate use of direct instruction strategies and collaborative, inquiry-driven knowledge construction strategies" (p. 4). Common Core and other 21st century standards and learning skills are emphasizing the importance of students developing critical thinking and problem solving skills and the 1:1 environment lends itself to this type of learning.

Sometimes teachers experience benefits of 1:1 technology in the areas of administrative and management efficiency as opposed to in their teaching approaches (Lai & Pratt, 2008). In fact, this was one of the most mentioned benefits by teachers in a survey conducted by Lai and Pratt. The devices allowed students to complete their work with less time and space constraints, communicate more easily with teachers and peers, and save time when completing work.

The Impact of the 1:1 Model on Students

One-to-one initiatives are often preferred over other models because they not only impact teaching and instruction, but impact how students learn. Well-prepared teachers who utilize technology effectively can help students to engage in powerful learning experiences (Mouza, 2008). Lei and Zhao (2008) interviewed teachers and found that 1:1 initiatives "enriched students' learning experiences, expanded their horizons and opened more opportunities and possibilities (p. 117). Students in these programs were able to be more active in their learning (Gulek & Demirtas, 2005; Lowther et al., 2003). A common way that students were more active in their learning was through their learning with multimedia tools. The laptop initiatives allowed many students to use presentation software, software for making and editing digital images and

movies, and productivity software. A few examples provided by the Grimes and Warschauer (2008) study mentioned how schools used iMovie to create more active learning experiences for students. The examples included a group of third graders that went on a field trip to a historic site and created an iMovie based on the site they visited and photographed. The students were able to personalize a piece of history and make it more relative to their lives. Some seventh grade language arts students created an iMovie advertisement for a novel they had read in class. This of course forced the students to have to decide on the significance of the novel and communicate this impact to other students. Finally, a fifth grade class created iMovies on the Bill of Rights. Students were assigned one of ten amendments and this made the learning more meaningful than memorizing each of the amendments. Another study showed that students used their computers to access classroom websites and create videos to share their information (Dunleavy et al., 2007). These examples show how 1:1 technology was used in schools to create new learning opportunities that made learning more active for students.

Another advantage of 1:1 programs that is that they can increase students' abilities to learn independently (Grimes & Warschauer, 2008; Hatakka, Andersson & Gronlund, 2012 Lei & Zhao, 2008; Zucker, 2004). With the direction of a knowledgeable and technically competent teacher, students who each have their own laptop can direct their own learning (Gulek & Demirtas, 2005) and have greater autonomy over their learning and studying in and out of school (Grimes & Warschauer, 2008). This increase in independence and autonomy can help students to take responsibility for their learning and foster creativity and analytical ability (Hatakka et al., 2012). This independence can also encourage students to choose software, content and tools that

best fit their learning styles. This has helped students with disabilities overcome their disabilities in many ways (Hatakka et al., 2012).

One-to-one devices can be a great study tool for students and help them to work harder and contribute higher quality work, organize more effectively, and improve their overall efficiency. In one study, 79% of students surveyed felt that they were able to work harder because of the laptops given to them in their 1:1 initiative (Grimes & Warschauer, 2008). This same study also found that 65% of the teachers felt that students using laptops produced higher quality work. A Silvernail and Lane (2004) study of 26,000 students discovered that 70% of the students felt that the 1:1 laptops helped them to produce better quality work and be better organized. Multiple studies also surveyed students and discovered that the laptop initiatives helped students to complete quality work, more quickly (Fadel & Lemke, 2006; Lowther, Ross & Morrison, 2003).

Multiple studies found that 1:1 initiatives increased students' research opportunities and research skills (Bebell & Kay, 2010; Bebell and O'Dwyer, 2010; Grimes & Warschauer, 2008; Gulek & Demirtas, 2005; Lowther et al., 2003). Not only were students able to develop their research skills, but they also were able to conduct more in depth studies (Grimes & Warschauer, 2008; Gulek & Demirtas, 2005). A 2007 Dunleavy, Dexter and Heinecke study observed eight classrooms in two middle schools and found that online research in conjunction with productivity tools was the most frequent way the laptops were used by both teachers and students. The 1:1 technology gave students the opportunity to take part in "just in time" learning where they could research information at the exact time or point that it was needed (Grimes &

Warschauer, 2008). This is a great example of a student learning strategy that mobile labs or shared classrooms have difficulty providing.

While one-to-one studies often provided students with more opportunities to work independently, conversely studies also found that 1:1 initiatives contributed significantly to collaboration between students (Bebell & Kay, 2010; Dunleavy & Heinecke, 2008; Grimes & Warschauer, 2008; Gulek & Demirtas, 2005; Lei and Zhao, 2008; Lowther et al., 2003; Mouza, 2008; Penuel, 2006; Rockman et al., 1998). Chrystalla Mouza (2008) observed "students frequently trading skills with other students, shared technology related tips, and served as peer tutors for both technology and non-technology related tips" (p. 464). Overall students helped each other more (Grimes & Warschauer, 2008) and became "collaborators" (Gulek & Demirtas, 2005). This increased collaboration, also increased students class participation (Lei & Zhao, 2008).

Finally, studies showed that 1:1 students' technology proficiency increased dramatically over students who did not have their own device. A fourth grader summed up the importance of this finding by saying, "If you would like to become something in your life, you really need to know how to use computers" (Mouza, 2008, p. 460). This increased computer proficiency increased the realm of learning opportunities for students and is a key factor in research that 1:1 initiatives contribute over other models.

Major Contributions of One-to-One Initiatives

Zucker (2004) contended, "documenting impacts of 1:1 computing on achievement in a rigorously designed study is, in a sense, the holy grail for researchers in the field" (p. 378). While the U.S. Department of Education and National Science Foundation have spent tens of

millions of dollars on assessing the impacts of technology on student outcomes, the process is complex. Despite the complexities, there have been numerous research studies that have found 1:1 initiatives to have a positive impact on test scores (Bebell, & Kay, 2010; Dunleavy & Heinecke, 2008; Dwyer, 1994; Fadel & Lemke, 2006; Grimes and Warschauer, 2008; Gulek and Demirtas 2005; Hayes and Greaves, 2013; Jeroski, 2003; Lowther et al., 2003; Mouza, 2008; Rosen & Manny-Ikan, 2011;Schwarz, 2012; Shapley et al., 2010; Silvernail, 2008; Suhr et al., 2010). Gulek and Demirtas (2005) studied a total of 259 middle school students and followed some that were in laptop cohorts and others that did not have their own devices and they found that the laptop students showed significantly higher achievement in both language arts and mathematics standardized tests after only one year in the program. The Mooresville school district in North Carolina implemented a grade 4-12 one-to-one program and saw proficiency scores grow from 73 percent proficient in reading, math and science to 88 percent proficient in the third year of the program (Schwarz, 2012). Hayes and Greaves (2013) Project RED research studied 1,000 schools in the United States and found that if implemented effectively, one-to-one technology programs can lead to improved student achievement. The Metiri Group conducted a review of 1:1 learning in 2006 and discovered that 1:1 students achieved significantly higher test scores and grades for writing, English Language Arts, mathematics and overall grade point averages than students that were not enrolled in 1:1 programs (Fadel & Lemke, 2006). Even the oldest reported 1:1 initiative, Apple Classrooms of Tomorrow (ACOT), reported higher test scores in the first two years of the project compared to non-ACOT classrooms in the areas of vocabulary, reading comprehension, language mechanics, math computation and math concept/application (Dwyer, 1994).

Overall in studying the research, positive increases in ELA test scores were more common than in math and science (Bebell, & Kay, 2010; Suhr et al., 2010). In a meeting of the American Educational Research Association in 2008, researchers presented evidence of 1:1 middle school students in the Maine statewide program (Silvernail, 2008) showing statistically significant improvements in English Language Arts achievement, but not in mathematics. Gulek and Demirtas (2005) even statistically controlled for prior achievement levels and still found a significant difference in ELA scores for middle school students in a 1:1 program in Pleasanton, California. Suhr, Hernandez, Grimes and Warschauer (2010) studied upper elementary 1:1 students compared to non-1:1 students and found that 1:1 students outperformed the non-1:1 students on English Language Arts assessments. They found that "laptops may have a small effect on increasing ELA scores, with particular benefits in the areas of literary response and analysis and writing strategies" (p. 38). Shapley, Sheehan, Maloney & Walker (2010) even discovered that students' using their laptop for learning at home was the "strongest implementation predictor of students TAKS standardized reading scores" (p.48).

In many studies writing was commonly referred to as an area that was positively impacted by 1:1 initiatives. Various qualitative studies detailed the effect that 1:1 programs had on students writing abilities. Penuel (2006) reviewed thirty 1:1 studies and found that the studies that measured 1:1 learning outcomes consistently had positive effects on students writing skills. Grimes and Warschauer (2008) found that 1:1 programs could have an important effect on the teaching and learning of writing. Gulek and Demirtas (2005) and Mouza (2008) both found that 1:1 laptops could lead to more students writing and writing of higher quality. Jeroski's (2003) observations concluded that the use of 1:1 laptops helped students engage in the writing process

more effectively and efficiently. Jeroski even found that one-to-one programs helped students attitudes towards writing improve.

While there is a large amount of qualitative data supporting 1:1 initiatives positive impact on student writing, there are also several sources that reference the impact of 1:1 initiatives on students writing assessment scores. Mouza's (2008) studies of 1:1 laptop groups compared to non-laptop groups showed higher gains in writing for the 1:1 students. Bebell and Kay (2010) identified that students not only wrote longer, but also scored higher on open response essays. Gulek and Demirtas' (2005) found that 95% of sixth graders and 91% of eighth graders met or exceeded grade level expectations compared to district averages of 81% in sixth grade and 84% in eighth grade. Jeroski's (2003) study discovered that students who met or exceeded writing performance standards rose from 70% in fall 2002 to 92% in spring 2003. The highly cited Maine MLTI statewide implementation found that five years after the implementation the students average writing score on the Maine Education Assessment (MEA) was 3.44 points higher than in 2000 based on data from 16,251 students. A Lowther, Ross and Morrison (2003) study of fifth, sixth and seventh grade students performed a MANOVA to determine that there was a highly significant 1:1 program effect on district writing scores. Couple these studies with the future movement of many writing assessments to an online format and there is cause for schools to look more closely at the benefits of using 1:1 initiatives to help with writing.

In the 1:1 study, math was often the subject that used the devices the least amount compared to other subjects (Bebell & Kay, 2010). Despite the computers being used less, the Mouza (2008) study showed academic gains in mathematics and also found that the students use of spreadsheets helped them develop an appreciation for mathematics, reinforced their

understanding of mathematical concepts and helped them improve their graphing abilities. Both Gulek and Demirtas (2005) and Shapley, Sheehan, Maloney and Walker (2010) found statistically significant gains in math standardized test scores. While the math scores increased, it is worth noting that the student achievement gains in math were not as well documented as gains in reading and language arts.

The least documented student gains were in science. It is difficult to decipher whether this lack of evidence is due to science achievement gains being studied less in 1:1 research or whether 1:1 initiatives have less of an impact on the area of science. While science test gains were lower than other subjects, there are still studies that show positive effects on student achievement in science. Dunleavy and Heinecke (2008) conducted a middle school study comparing 1:1 classrooms to non 1:1 classrooms and found a significant increase in science scores in the 1:1 program. This same research found that boys had a much greater increase in their science test scores than girls.

Research has not only found 1:1 initiatives to increase student achievement, but also to close achievement gaps between different student populations (Rosen & Manny-Ikan, 2011; Schwarz, 2012). Achievement gaps are gaps between the achievement level or proficiency of traditional students and other subgroups such as students with disabilities, economically disadvantaged students, English as second language learners and minority students. Many states measure these achievement gaps yearly and expect for schools to be closing these gaps and ultimately helping subgroup students to catch up to their fellow grade level students. Mooresville school district is one school district that has utilized their 1:1 program to close achievement gaps (Schwarz, 2012). A special education case manager within the district named

Melody Morrison described the recent focus on subgroup students by saying; “They’re not just our kids anymore. They’re everybody’s kids—all teachers throughout the school” (p. 2). The digital conversion has leveled the playing field.” Some even go as far to contend that 1:1 initiatives can play a social role in bridging the achievement gap between students (Rosen & Manny-Ikan, 2011).

While standardized test scores tend to be the traditional standard to measure student achievement, other studies found effects of 1:1 initiatives on student achievement that were measured in other ways. Other ways student achievement was measured, was in End of Course (EOC) grades, overall GPA and graduation rates. Gulek and Demirtas (2005) used the approach of comparing 1:1 cohorts to non 1:1 cohorts within a middle school and found a substantial difference between 1:1 students EOC grades and non-laptop students EOC grades. They found that the 1:1 students achieved a higher percentage of "A" grades and a lower percentage of "F" grades in both English and mathematics. This same study found that the students in the 1:1 Laptop Immersion Program earned higher overall Grade Point Averages (GPA) than non-participating students in each grade level. The largest difference was observed in sixth grade. Finally, in a well-publicized 1:1 initiative in the Mooresville school district in North Carolina, the district’s graduation rate was at 91% in 2011 compared to 80% in 2008 (Schwarz, 2012). Despite the district having limited funding and ranking 100 out of 115 districts in North Carolina in per pupil spending, the district rose to the 3rd highest ranking in test scores and second highest ranking in graduation rate in only three years of implementing their 1:1 initiative. A public charter high school in Denver, Colorado utilized a 1:1 program and various digital tools to help 30% of the seniors take the Advanced Placement Physics test compared to only 3% of national

seniors that usually take the test. A larger amount of students not only took the test, but the Colorado students scored at or slightly above the national average on the test, meaning that a large number of students were exceptionally high in the area of physics (Zucker & Hug, 2008).

While the main focus of 1:1 contributions is generally on increasing student achievement, there are many positive effects that come from 1:1 initiatives that may be desirable in themselves, but still help lead to increased student achievement. Examples of these are increased parental involvement and increased student engagement and motivation. Zucker (2004) calls these intermediate outcomes.

Attendance is a great example of an intermediate outcome. While having students at school more often is a desirable goal, this increased presence at school leads to more instructional time, which can possibly lead to greater student achievement. Lemke and Martin (2003) studied the Maine MLTI statewide program and cited a 7.7% increase in attendance after the implementation of their 1:1 program. The earliest 1:1 initiative, Apple Classrooms of Tomorrow (ACOT), reported that of the 216 students in their study, their average rate of absenteeism was almost cut in half (Dwyer, 1994). Harris and Smith (2004) even found that in Maine the attendance of the students with disabilities improved during their initiative.

Another intermediate outcome of 1:1 programs was the reduction of discipline problems. Constant discipline problems cut into instructional time and any improvement in this area can assure that students are in classes more and able to receive more instruction. Various studies have shown that 1:1 programs can reduce disciplinary problems (Baldwin, 1999; Lemke & Martine, 2003). Lemke and Martine's (2003) policy study of the MLTI statewide 1:1 initiative

found a 54% drop in behavior letters sent home. These large reductions in student behavior problems can provide numerous benefits to student learning.

Increased parental involvement at school was another intermediate outcome found in research. Lei and Zhao's (2008) study of a midwestern middle school 1:1 program showed that parental involvement increased significantly over the academic year. At the start of the year parental involvement was fairly low. About 54% of the parents spent time working with their students on homework and about 22% of them worked with their students on computers. By the end of the year 68.4% spent time working with students on homework and 45.8% worked with their students on computers.

Finally, a major intermediate outcome that cannot be ignored is the impact 1:1 initiatives have on students' engagement and motivation. One of the most universal benefits of 1:1 initiatives that has been referenced in a large amount of studies was increased student motivation and engagement (Bebell & Kay, 2010; Bebell & O'Dwyer, 2010; Grimes & Warschauer, 2008; Gulek & Demirtas, 2005; Mouza, 2008; Schwarz, 2012; Silvernail & Lane, 2004; Suhr et al., 2010). A more engaged and motivated student is ultimately a more attentive student that is in a great mindset to learn and when students are more motivated, they demonstrate improved achievement (Roderick & Engel, 2001). Bebell and Kay (2010) discovered that student engagement increased dramatically in a 1:1 computing program. Silvernail and Lane (2004) also noticed higher levels of engagement among special needs students. Chrystalla Mouza (2008) found that urban students in a 1:1 environment were more motivated to complete schoolwork and often go above and beyond on assignments, which in turn improved the quality of their work. Students in 1:1 programs were not only highly engaged, but they more focused, spent more time

on their work and were able to complete larger projects (Rockman et al., 1998). Teachers in diverse schools in California were in 84% agreement that their schools 1:1 laptop program raised their students' interest in class (Grimes & Warschauer, 2008). In this same study, 74% of students felt that their schoolwork was more interesting once they got their laptops. Parents of 5th, 6th, and 7th graders even agreed that their school's 1:1 initiative increased their children's interest in school (Lowther et al., 2003). For some students, the introduction of 1:1 devices not only added to their engagement and motivation, but also allowed for a more "fun-learning environment" (Hatakka et al., 2012). Overall these intermediate outcomes can potentially lead to higher student achievement, but also can have many other positive effects on a school.

The Negative Aspects of 1:1 Initiatives

In fact Hayes and Greaves (2013) research suggests that two thirds of 1:1 initiatives did not improve learning. Holcomb (2009) proclaimed, "With the cost so high and no guarantee for success, many schools are either abandoning or shying away from 1:1 implementations" (p. 53).

One-to-one initiatives are a costly solution and while there is substantial research documenting the positive effects of 1:1 initiatives, there are also many 1:1 detractors and a large amount of research that paints a negative light on one-to-one initiatives. Winnie Hu (2007) claimed that 1:1 initiatives are the latest example of "how technology is often embraced by philanthropists and political leaders as a quick fix, only to leave teachers flummoxed about how best to integrate the new gadgets into curriculums" (p. 2). Larry Cuban, a self-proclaimed skeptic of 1:1 computing, is quick to question the thought that computers will revolutionize teaching and learning and improve test scores and he argues that achievement gains more likely emerge from innovative teaching practices and thus we are confusing the medium (computers)

and the message (effect) (Cuban, 2006). Even back in 1972 Alan Kay looked into the future and predicted that if personal computers become a "teaching box" and are used in education, they could be "like a piano, but one which can be a tool, a toy, a medium of expression, a source of unending pleasure and delight...and, as with most gadgets in unenlightened hands, a terrible drudge" (p. 1)! The psychologist Richard E. Clark used an analogy to sum it up well in 1983 long before 1:1 initiatives began to emerge by saying:

> The best current evidence is that media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition. Basically, the choice of vehicle might influence the cost or extent of distributing instruction, but only the content of the vehicle can influence achievement (p. 445).

Ultimately these critics believe that the power to transform learning belongs not in the electronic device, but in the hands of the teacher.

There are many other negative aspects associated with one-to-one initiatives in research. Some are concerned that 1:1 initiatives create an over dependency on information technology (Lei & Zhao, 2008). Lei and Zhao study of a northwestern middle school found that 38.7% of parents believed that their students spent too much time on their laptops. Dunleavy, Dexter and Heinecke (2007) found that the biggest challenge for teachers in their 1:1 study was classroom management. Teachers across the sites they studied felt that classroom management became more difficult once the computers were introduced. Lei and Zhao also discovered that these initiatives could lead to student discipline problems. Hu (2007) found that students at Liverpool High School hacked into local businesses, downloaded pornography, and even used the

computers to share answers on a test. Other schools reported increased plagiarism (Hatakka et al., 2012).

Some studies also found that 1:1 technology could be a distraction for students (Hatakka et al., 2012; Lei and Zhao, 2008). In Lei and Zhao's (2008) study 39.3% of the 28 teachers involved felt that it had become harder for students to concentrate in class because of their new laptops. In one study students would play games or access and use social media sites as opposed to listening to the teacher or doing assignments (Hatakka et al., 2012). Hardware and technical glitches were also a concern in a few studies (Dunleavy et al., 2007; Hu, 2007). Some teachers limited their laptop use in class because of the constant technical glitches they had to deal with that prevented them from being able to finish their lessons (Hu, 2007).

One study even discovered that students reported that the laptops had a negative effect on their health (Hatakka et al., 2012). This was because students sat in front of their computers so long during class and breaks that they developed back, neck or headaches. This same study even claimed that students' well-being was affected because the long time spent on laptops led to them become less social. Some have even questioned the idea of providing every student with a computer. Even the early Apple Classrooms of Technology Initiative classrooms were found to have collaboration, independent work and student engagement, but ultimately the 1:1 ratio was deemed unnecessary because "a half dozen computers could achieve the same level of weekly use and maintain the other tasks that students and teachers had to accomplish" (p. 30).

The second most cited negative aspect of 1:1 initiatives are the high costs associated with the programs (Grimes & Warschauer, 2008; Holcomb, 2009). In fact, Holcomb (2009) claimed that there have been few educational initiatives that have been as costly as modern day 1:1

initiatives. These high costs go beyond the initial cost of equipment and involve the cost of maintaining the devices. Grimes and Warschauer (2008) believe that these costs must be weighed with the attractiveness and benefits of 1:1 programs.

As previously mentioned, "documenting impacts of 1:1 computing on achievement in a rigorously designed study is, in a sense, the holy grail for researchers in the field" (Zucker, 2004, p. 378). This is why it is so concerning for researchers when these initiatives are not found to have an impact on student achievement. Thus the most cited negative aspect of 1:1 initiatives is that many studies have found that these initiatives have little to no effect on student achievement (Carr, 2012; Grimes & Warschauer, 2008; Holcomb, 2009; Rosen & Manny-Ikan, 2011; Zucker, 2004). Larry Cuban (2006) claims that:

> The fact is that one-to-one access has failed to show a direct link to improved test scores. For the past 80 years of research on technology's impact on learning, from primitive projectors to modern laptops, not much reliable evidence has emerged to give impartial observers confidence that students' use of computers or any other electronic device leads directly to improved academic achievement (p.30).

In one of the largest ongoing studies of one-to-one initiatives, the Texas Center for Educational Research studied the long-term effect of 1:1 laptops on student learning in 21 Texas middle schools compared to a control group of 21 Texas middle schools that did not implement the 1:1 laptops. The results showed no statistical significance in standardized mathematics achievement tests for the majority of the students that were a part of the laptop initiative (Carr, 2012). A school board president named Mark Lawson, from a Liverpool school district in New York that was one of the first districts in the state to experiment with 1:1 technology. Mark Lawson agreed

with these other critics and found that "after seven years (of implementing their initiative) there was literally no evidence the initiative had any impact on student achievement—none" (Hu, 2007, p. 1). School officials in the Liverpool district agreed claiming "laptops had been abused by students and did not fit into lesson plans and showed little, if any, measurable effect on grades and test scores at a time of increased pressure to meet state standards" (p. 2). These studies and others have made districts question whether the investment is worth it and whether these initiatives will positively impact student achievement.

Due to the negative research on 1:1 initiatives that has surfaced, some schools are reconsidering their future or current investments in their 1:1 programs. Winnie Hu (2007) claims that some schools are abandoning them because they are "educationally empty." Her research referenced various examples of schools in California, Florida, Massachusetts, New York, and Virginia that dropped their 1:1 laptop programs. Everett A. Rhea Elementary School in California gave away 30 brand new laptops because the new teachers coming in did not "do as much with the technology." Hu referenced that the sixth largest district in the country in Broward County, Florida revaluated the expenses of a district wide 1:1 project that would have cost the district a staggering $275 million. The Florida district decided against the initiative because their pilot 1:1 project for four schools cost the district $7.2 million to begin with and the district had to spend around $100,000 a year to replace keyboards and screens that were not covered by their warranties. Northfield Mount Hermon School in Massachusetts made a similar decision to drop their five-year-old program based on the fact that they were spending more energy on fixing the laptops than they were spending on training teachers. A high school in Richmond, Virginia eliminated their five-year-old laptop program in 2006, based on the students

in the program showing no academic gains compared to other schools without laptops. The school found that a fifth of their students rarely or never used the laptops for learning and continuing the program would have cost the school $1.5 million dollars for the first year alone. Tim Bullis, the district spokesperson summed it up with this quote, "You have to put your money where you think it is going to give you the best achievement results" (Hu, 2007, p. 2). The continued focus on standardized testing is forcing districts to make some difficult decisions regarding 1:1 programs.

The Mixed Results of One-to-One Initiatives

While there is evidence of both positive and negative impacts of 1:1 initiatives, some researchers are content with claiming the verdict on 1:1 initiatives is mixed (Carr, 2012; Hayes and Greaves, 2013). Whether one is a supporter or critic of 1:1 initiatives, many research studies reference the fact that there is somewhat of a disconnect between today's standardized assessments and the educational benefits of 1:1 initiatives (Grimes & Warschauer, 2008; Holcomb, 2009; Penuel, 2005; Zucker, 2004). This has been a big challenge for researchers of 1:1 initiatives because many studies use standardized test results as part of their study to measure the effectiveness of the initiative. One-to-one initiatives have been shown to increase the instructional focus on critical thinking, problem solving and constructivist teaching techniques. However, current assessments are problematic because "Most K-12 assessments in widespread use today—whether they be of 21st century skills and content or of traditional core subject areas—measure a student's knowledge of discrete facts, not a student's ability to apply knowledge in complex situations" (Grimes & Warschauer, 2008, p. 308). Future assessments for the common core standards have potential to change this, but it is still difficult to measure all of

the positive benefits of a 1:1 initiative by solely looking at test scores. Politicians and the overall public like easily measurable results that can quickly determine if an initiative is successful and 1:1 studies are not likely to provide this due to the complex nature of the initiatives. As Cuban (2006) mentioned, 1:1 initiatives may lead to more innovative teaching practices, but it is difficult to determine whether this was the effect of the devices or the teacher. Mark Warschauer, an education professor at the University of California at Irvine, summed up the benefits of laptops by saying, "If the goal is to use laptops to get kids up to basic standard levels, then maybe laptops are not the tool. But if the goal is to create the George Lucas and Steve Jobs of the future, then laptops are extremely useful" (Hu, 2007, p. 4). Researchers may need to reconsider their methods of evaluating 1:1 initiatives in the future in order to comprehensively measure the effectiveness of 1:1 initiatives.

Another challenge for researchers is the fact that 1:1 initiatives are rarely considered to be overnight changes. One-to-one initiatives can often be an example of a second order change that aims to transform teaching and learning and thus it may take a longer time to see student achievement increases. Bebell and Kay (2010) claimed that the impacts of a 1:1 initiative could take many years to be fully realized by sharing the sentiments of a teacher that said "even after a couple of years we still feel like we're just getting accustomed to teaching in a 1:1 setting' (p. 21). A "1:1 initiative is a huge undertaking that requires time before a true impact can be measured" (Holcomb, 2009, p. 53). Some 1:1 schools even saw a negative impact on teaching and learning the first year of their implementation (Grimes & Warschauer, 2008; Rockman et al., 1998). Grimes & Warschauer (2008) saw a decline in ELA scores in the first year in their 1:1 research and attributed this to the complexity of introducing such a fundamental change in the

overall tools of learning. The schools however, did make strong gains in year two of the initiative. The fact that 1:1 initiatives can take some time to see impacts adds to the challenge for researchers.

Principal Leadership of Instructional Technology

When researching the topic of instructional technology, much of the focus is placed on the students, teachers and devices. Whether the study focuses on instructional technology and its impact on student achievement, the influence that instructional technology has on transforming learning environments or implementing a one-to-one environment, the importance of principal leadership in instructional technology in education is occasionally minimized in the literature (Michael, 1998). Regardless of the main focus of the current research, many studies claim the principal has a major responsibility to lead a school in integrating technology in the classroom (Dawson & Rakes, 2003; Yee, 2000; International Society for Technology in Education, 2009).

Schiller's (2003) research found that principals play such an integral role that without them the potential of instructional technology may not come to fruition at a school. Chang's (2012) studies in Taiwan showed that technology leadership is gaining importance. Chang even suggested his research findings claimed that the single most important task of a twenty first century principal is to become an effective technological leader. Studies have found leadership of technology to be one of the most critical factors that affects technology integration (Byrom & Bingham, 2001)

Part of the reason that the principal's role in technology integration is seen as important in the literature is because of studies that have shown the influence principal leadership has on the amount of instructional technology used in the classroom. Multiple studies have shown that

principal technological leadership correlates with a teaching staff's integration of technology (Anderson & Dexter, 2005; Chang, 2012; Shapley et al., 2010). Anderson and Dexter's (2000, 2005) study of 1,150 schools that involved 867 school principals, 4100 teachers and 800 technology coordinators found that technology leadership was a stronger predictor for 3 measures compared to infrastructure factors. These three factors influenced more by technology leadership were: frequency of use of the Internet by students and teachers, extent to which students used technology for academic works in school and frequency of technology integration into lessons. Chang (2012) referred to technology classroom integration as "technological literacy" and his studies found a strong correlation between principal technological leadership and the teachers' technological literacy. Chang (2012) concluded that a teacher's successful instructional technology use could positively affect academic achievement.

Some believe that technology leadership doesn't fall solely on the shoulders of the school principal. The "shared leadership" or "distributed leadership" leadership approach acknowledges that leadership involves multiple leaders (Spillane, 2005).

Various instructional technology researchers have stressed the importance of taking a team approach with school technology leadership (Cowie et al., 2011; Dexter, 2007, 2011). Dexter (2007, 2011) believes that a team of people should share technology decision-making responsibilities. Technology leadership should be "distributed across a team of people that altogether provide technology expertise and decision making authority and who take responsibility in setting direction, developing people and making organizations work for technology" (Dexter, 2007, p. 20). This team approach to technology leadership recognizes that only so much can be done through the actions of one principal.

Administrators frequently approach the integration of technology in their schools by thinking that all they have to do is merely buy computers for their teachers and students to improve teachers' pedagogical practices (Afshari et al., 2009). Simply buying and installing computers and networks does not lead to major educational reform or changes in instructional approaches (Cuban et. al, 2001). Literature shows that teachers and students do not notice the presence of technology and effective use of technology without any support. In fact, the essence of integrating technology in the classroom is not about helping students and teachers use computers, but integrating technology is about helping teachers utilize technology as a tool for learning (Sheingold & Hadley, 1990). When leaders focus too much on the acquisition of hardware and software, they forget about the cultural and organizational pieces of effectively integrating technology, which leads to enhanced student learning. This myopic acquisition focus often leads to computer labs that are not enhancing instruction, and they become expensive game labs, typing practice rooms or stations that only help students work on routine skills (Davies, 2010).

Roles of Principal Leaders of Instructional Technology

If literature points to the principal being an important part of technology integration in the classroom and the principal's role being more than just a buyer of technology, what should a principal's technological role look like? The roles of principals have changed so much that the International Society for Technology in Education (ISTE, 2009) developed technology leadership standards that are known as the National Technology Standards for Administrators (NETS-A). The ISTE leadership standards consist of the following 5 standards (2009):

1. Visionary Leadership

2. Digital Age Learning Culture
3. Excellence in Professional Practice
4. Systemic Improvement
5. Digital Citizenship

The NETS-A standards were developed by experts and are a set of suggestions of what principals should be capable of in the area of technology leadership.

Educational literature references a substantial amount of roles that leaders of technology play. Some of the common roles that principals held as technology leaders were: a visionary, digital expert, manager of resources, model of technology use, technology supporter, leader of change, evaluator of technology, encourager and supporter, family and community engager and leader of ethics in technology.

The NETS-A standards referenced Visionary Leadership as the first standard and the importance placed on vision is common throughout the literature. Numerous literature studies showed the impact a principal's technological vision has on a school (Banoglu, 2011; McGarr & Kearney, 2009; Peck, Clausen, Vilberg, Meidl, & Murray, 2008). Other researchers placed an emphasis on the need for a shared vision among a school's staff to successfully implement instructional technology (Anderson & Dexter, 2005; ISTE, 2009; Flanagan & Jacobsen, 2003). A shared vision of technology use can greatly influence the outcomes of a 1:1 initiative (Peck et al., 2008). Yee (2000) found that a school leader must create an environment and culture that aligns with the leader's comprehensive integration of technology in the school's vision. Chang's (2012) study highlighted the importance of a school leader knowing the current direction and trends of technology development and understanding how these trends align with their school

and the school leader's vision. However, before a principal can provide a compelling vision for technology integration, some studies felt that district and project leaders must first provide teachers and administrators with a clear vision of how the computers are to be used (Valiente, 2010; Zucker & Light, 2009).

Sara Dexter (2011) conducted a cross case analysis of five case studies of team-based technology leadership in 1:1 middle schools. Dexter not only discovered the importance of a school leadership team having a strong vision, but also noted the importance of that vision including strong curricular and pedagogical components. At Fulton and Shelby middle school, Dexter observed a leader's vision that lacked these pedagogical components and this in turn made it relatively easy for teachers to opt in or out of integrating technology during their initiative. In contrast, her experience at Lewis, Jackson and Lincoln middle school was drastically different. The leaders at these three schools set a vision and purpose for the laptops that included pedagogical components and this allowed the leaders to establish structures, routines and tools that more frequently focused on teaching and learning issues. Dexter's (2011) study found that without a vision that includes a pedagogical focus, technology implementations could be reduced to only being about maintaining adequate access and technological support for the participants. Dexter summed up the importance of a leader having a strong technology vision by saying, "Perhaps the central implication of these results for technology leaders is the importance of being cognizant of the power of a technology vision and expressing that vision in a coherent fashion" (p. 185).

Banoglu's (2011) research found that principals consistently rated themselves as adequate in the area of technology leadership. However, Banoglu found that most schoolteachers find

principals to be minimally proficient in technology leadership. This gap between the two findings accentuates the literature that expresses the importance of having a school leader who is an expert in technology. Flanagan and Jacobsen (2003) expressed that if school leaders are not prepared for this role as an expert, they may struggle to achieve desired instructional technology outcomes in their schools. Research by Akbaba-Altun (2004) showed that most principals are aware of the importance of their role in technological leadership, but expressed that they do not have the knowledge and skills necessary to be an effective technology leader. McCarr and Kearney (2009) conveyed that effective pedagogical leadership is impossible when school leaders are unaware of the ways that ICT can support teaching and learning across the curriculum. This computer incompetence can be a barrier for school leaders in the area of ICT (Flanagan & Jacobsen, 2003; Schiller, 2003). Dexter (2007) conducted a qualitative study on four 1:1 middle schools and suggested that "if principals wish to advance an initiative like technology integration in classrooms, they may need to develop expertise and not just hire it so they can leverage their authority" (p. 20). Leaders who have a strong technological capacity can use their knowledge to build more technological capacity in their teachers (Flanagan & Jacobsen, 2003).

While literature supports the importance of being an expert in technology, it is just as critical that principals model the use of technology to their staff (Afshari et al., 2009; Anderson & Dexter, 2005; Cakir, 2012; Peck et al., 2008). This modeling means that they learn how to use the technology themselves and utilize technology in their everyday lives. A principal who models the use of instructional technology makes it more likely that teachers model technology use for their students (Afshari et al., 2009). If a principal is not serious about modeling

technology, then a school's efforts to implement more technology can be threatened (Anderson & Dexter, 2005). Hughes and Zachariah (2001) found that the success or failure of a school's technology integration could be related to the ideologies and behaviors of the instructional leader.

Technology leadership in literature has traditionally been focused on managing the school's technology resources. While the literature on technology leadership has grown to focus on many other areas besides managing resources, the current literature still speaks of the importance of a principal successfully managing technology resources (Anderson & Dexter, 2005; Banoglu, 2011; Flanagan & Jacobsen, 2003; McGarr & Kearney, 2009; Tan, 2010). This includes the day-to-day responsibilities of budgeting, fundraising, purchasing technology, and providing employees with access to technology.

A principal needs to be smart in managing a school's technology budget and how the school uses the budget to purchase technology equipment (Thomas & Knezek, 1991). The principal needs to be creative in how they fundraise for their technology efforts (Banoglu, 2011; Thomas & Knezek, 1991). Yee (2000) believed that a principal's fundraising can include anything from basic fundraising to business partnerships, university grants, or government grants. Yee called this fundraising role for a principal, "entrepreneurial networking" (p. 297).

Banoglu (2011) found that the principal has the role of managing the logistics of the technology equipment. This can be duties from allocating the technology equipment to making sure everyone has access to the computers (Anderson & Dexter, 2005; Banoglu, 2011). Managing the logistics of technology also can be basic decisions like deciding on the location of computers in classrooms to wiring classrooms for Internet access (Yee, 2000).

A McGarr and Kearney (2009) study showed that sometimes principals play the role of part time technology support. McGarr and Kearney explained that principals reported that they had to play this role of technology supporter, due to how expensive technology support was. In the study, playing this role was seen as one of the principals' major impediments to achieving the further implementation of technology in their school, because the principals felt ill prepared.

Change is often seen as the one consistent in the world of education. This is exceedingly true in the world of instructional technology and at the school level the role of leader of instructional technology change is a role held by many school principals. Tan (2010) categorizes the responsibilities of a technology leader of change into four areas: infrastructure, organization and policy, pedagogy and learning and school culture.

Tan (2010) found that technology leaders "play an important role in providing an infrastructure that is conducive to the use of instructional technologies" (p. 898). This infrastructure includes hardware, software and resources. Yee (2000) argued the importance of this infrastructure being equitable to all students and staff.

Tan (2010) found that being a leader of organizational and policy change was one of the most common roles played by a school leader. This could be an indicator such as implementing a property policy, creating a staff development policy or setting up a technology committee (Anderson & Dexter, 2000, 2005). An example of this is constant monitoring of school progress (Schiller, 2002; Yee, 2000). This role encompasses any organizational decisions that a school principal makes.

"It is important to acknowledge that the mere presence of a technology-rich environment is not sufficient for enhanced teaching, learning or added value" (Dunleavy et al., 2007). Good

technology leaders recognize that their school must do more than just utilize instructional technology, but use technology to enhance student outcomes and pedagogy (Schiller, 2002; Yee, 2000). Yee (2000) contends that a technology leader can facilitate this by encouraging teacher experimentation with use of technologies in instruction. Ultimately, the quality of teaching can only be impacted by a school leader when instructional leadership and transformational leadership is integrated (Marks & Printy, 2003).

The goal of increasing technology in schools is not all about having and using technology, but increasing technology is also about changing a school's culture (Chang, 2012). Dexter, Seashore and Anderson (2002) contended that many schools ignore the importance of changing a school's culture when attempting to maximize effective technology implementation. Principals not only need to have positive attitudes about technology, but they also need to encourage teachers and students to be innovative in their practices (Cakir, 2012). In a 1999 study, Dexter, Anderson and Becker examined teachers' views of computers as catalysts for change. The study looked closely at teachers who demonstrated constructivist practices that incorporated computers in their instruction. Six out of the ten teachers that demonstrated the strongest constructivist orientations mentioned that school wide shared goals were the most influential factor in changing their instructional practices. One teacher in the study found that culture that was created by the administration and other teachers was very influential in their teaching practices. Dexter, Anderson and Becker (1999) referenced the importance of school culture when they said, "A supportive context with rich professional development experiences and a professional culture that encourages reflection and trying new approaches will produce the

learning necessary for technology use to become a part of the teacher's decision making" (p. 15). A school principal has a very influential role in setting a school's culture of technology use.

Often it is common for a school principal to play the role of evaluator in their everyday practices. However, it is less common for a principal to evaluate their school's everyday use of instructional technology. Some claim that an effective technology school leader will create technology evaluation procedures so that the school can learn from their ongoing experiences (Cradler, 1996). Anderson and Dexter (2000) constructed a taxonomy of instructional technology leadership decisions that divides decisions into six functions. One of those functions is program evaluation and impact assessment and they encourage school leaders to regularly monitor the use of technology and periodically measure student learning in order to identify any digital divides in the school. Valiente (2010) agrees, "Technical platforms to monitor use and pedagogical audits to observe the classroom are valuable" for administrators (p. 10).

Implementing a 1:1 initiative can be a big change for a school staff and the school leader needs to sometime take on the role of encourager and supporter. A successful implementation requires school leaders to provide support and encouragement to the staff throughout the initiative (Argueta, Huff, Tingen, & Corn, 2011).

Many believe that it is important for a school leader to take on the role of family and community engager so that families and the overall community can be a part of the technology integration. Some leaders do not think about involving the community in their technology efforts besides fundraising. Flanagan and Jacobsen (2003) identified involving the community in achieving technology integration as one of their main three objectives for school leaders. Involving the community allows for "plural voices" to be a part of the integration of technology

in a school (Davies, 2010). The community can be anyone from parents, to business partners, to other stakeholders (Bailey, 1997; Davies, 2012; Flanagan & Jacobsen, 2003; Thomas & Knezek, 1991). One school that was studied has had success with involving parents in technology decisions for years (Flanagan & Jacobsen, 2003). Often a forgotten piece of this community involvement and shared leadership is teachers and students (Davies, 2010). Davies argued that the voices of students and teachers involved in technology decisions are absent from much of the literature on technology implementation.

Technology has become an everyday and unavoidable part of our lives, thus the issue of ethics in technology has become all the more important. Because of the increased focus on ethics in technology, school leaders have had to take on the role of ethical technology leader. As an ethical leader, school leaders have to consider technology ethical issues including the digital divide, digital citizenship, accessibility, universal design, privacy and security.

As our world becomes more saturated with technology, there is an increasing divide between people who have access to technology and those who do not. This divide has often been called the digital divide and is defined by Compaine (2001) as "the gap, or perceived gap between those who have and do not have access to the information tools and between those who have and do not have access to the information" (as cited in Tavani, 2013, p. 304). In Compaine's view, a person must not only have access to the technology, but also have the skills and knowledge necessary to use the technology.

The digital divide is a pertinent ethical issue that can affect a school leader's daily job responsibilities. A school leader must first decide if they believe that the digital divide is an ethical issue. Maria Bottis and Ken Himma (2008) claimed that there is a big distinction

between saying that eliminating the digital divide is a "good thing to do" and saying that we are "morally obligated" to eliminate the digital divide. Others like Jeremy Moss (2002) believe that when people are deprived of cybertechnology resources they are unfairly disadvantaged. A school leader must decide where they fall on this spectrum and discover if they feel "morally obligated" to address the digital divide at their school or believe that this responsibility falls to the shoulders of others. Ultimately a school leader must decide if they believe that closing the divide and increasing students' access to technology can be the great equalizer.

Today's students live in a time where technology is an integral part of their everyday lives. They are one of the first generations to spend their "entire lives surrounded by and using computers, videogames, digital music players, video cameras, cell phones, and all the other toys and tools of the digital age" (Presnsky, 2001, p. 1). Presnsky called this new generation the "Digital Natives." However, just because this new generation's lives have revolved around technology does not mean that they know how to responsibly and ethically use this technology. Weigel, James and Gardner (2009) expressed this concern by saying:

> The Internet's potential for learning may be curtailed if youth lack skills for navigating it, if they consistently engage with Internet resources in a shallow fashion, and/or if they limit their explorations to a narrow band of things they believe are worth knowing. Left to their own devices and without sufficient scaffolding, student investigations may turn out to be thoughtful and meaningful—or frustrating and fruitless" (p.10).

Future ethical issues of using technology appropriately caused Hollandsworth, Dowdy and Donovan (2011) to pose the question, "Who will own this challenge of guiding students toward a productive and safe technological society?" (p.37). Many schools believe that this responsibility

falls on their shoulders and have made it a priority to teach students how to be good digital citizens. Ribble and Bailey (2004) defined digital citizenship as the norms and behaviors associated with technology use.

If a school leader believes that teaching digital citizenship is an important ethical issue, then their job responsibilities can be impacted in numerous ways. School leaders must consider the idea of digital citizenship in their everyday decisions. They cannot assume that students know the correct and appropriate way to utilize technology. School leaders need to inform teachers of the importance of teaching digital citizenship. They must also decide who is going to teach digital citizenship and how it will be taught. Will students be taught how to be responsible digital citizens in the regular classroom or will they have a separate class that focuses solely on digital citizenship? Will the ideals of digital citizenship be integrated into everyday learning or will students work through a particular digital citizenship curriculum? Hollandsworth, Dowdy and Donovan (2011) believe we will begin to see numerous vendors develop digital citizenship curricula in response to the developing needs of schools. School leaders may need to use school resources to provide teachers with the necessary resources and training to teach these important issues.

If a school leader chooses to ignore the ethical issue of digital citizenship, then problematic and even dangerous student behavior can result (Hollandsworth et al., 2011). School leaders could see a rise in discipline issues related to technology, which could add to their job responsibilities. Furthermore, ignoring the issue of digital citizenship could impact students and schools for years to come. According to Hollandsworth, Dowdy and Donovan (2011), "For a number of legitimate reasons, many schools tend to be reactive, rather than proactive about

such issues. However, the groundwork for digital citizenship is best laid in a proactive way, before problems arise" (p. 40). School leaders must make the decision of whether they choose to be proactive or reactive in their approach to digital citizenship, but either way it appears that digital citizenship is not an issue that is likely to go away anytime soon.

Finally, school leaders must consider the importance of the ethical issue of protecting student's online privacy and security. While this is not always a school's priority when spending school money, school leaders must keep in mind the ramifications of not investing in appropriate security and privacy systems to protect student data.

Another responsibility that arises from the issue of security and privacy, is school leaders ensuring that they have policies and procedures in place that help protect the security and privacy of students and teachers. Many schools have taken the next step in protecting themselves legally, by creating school Acceptable Use Policies (AUPs). According to Phillips and Sianjina (2013), an AUP is a written agreement signed by users that "state specific rules and regulations for technology use and outline possible punishments and penalties that can occur if the technology is used inappropriately" (p. 19). These documents can be signed by both students and parents and are a legally binding contract between two entities. Other schools and districts have also created Internet Use Policies (IUPs) for their employees. These IUPs are similar to AUPs and help "inform employees of appropriate use and professional conduct while using an Internet system (p. 39). Whatever a school leaders beliefs about school security and policy, they must consider policies like these in order to lay out clear expectations and protect their schools in the event of a breach of security or privacy. According to Hatakka, Andersson and Gronlund

(2012), these rules and agreements put in place for access to the Internet can have a direct effect on a student's performance.

We know that numerous studies have shown that principal's instructional technology leadership correlates with a staff's integration of instructional technology (Anderson & Dexter, 2005; Chang, 2012), but the roles a principal adopts in a 1:1 initiative is equally important. A study on a widespread Texas 1:1 initiative reported that "Respondents at 1:1 schools with higher technology implementation reported that committed leaders, thorough planning, teacher buy in, preliminary professional development for teachers, and a commitment to the transformation of student learning were keys to the successful implementation of Technology Immersion" (Shapley et al., 2010, p. 46). Hayes and Greaves (2013) research even cited the importance of school leaders by saying that they have never seen a successful 1:1 implementation where the principal was weak. Much of the literature references the importance of strong school leadership, but there are many unanswered questions about the roles a principal plays in the successful implementation of a 1:1 initiative. Principals need specifics on how to effectively lead a 1:1 initiative and future research needs to focus on providing school leaders with best practices of how to best lead a 1:1 initiative in order to produce improved student achievement.

Providing Professional Development for Teachers

The sad reality is that about half of US school teachers receive a mere one to eight hours of professional development a year and only two thirds of teachers report that they are adequately trained to integrate technology in their instruction (Gray, Thomas & Lewis, 2010). High quality professional development is crucial to the successful integration of instructional technology (Cakir, 2012; Flanagan & Jacobsen, 2003; Gerard et al. 2008; Yee, 2000). Shapley,

Sheehan, Maloney and Walker (2010) discovered that a teachers "level of technology implementation was statistically significant related to their quality of professional development (r=.47)" (p. 33). A study by Gerard et al. (2008) found that 92% of the principals felt that professional development was essential for the effective implementation of technology. Yee (2000) argued for the importance of a principal having a passionate commitment to supplying great instructional technology professional development. Many teachers are apprehensive about further implementing instructional technology in their rooms because of the lack of meaningful opportunities they are provided to learn how to do this (Flanagan & Jacobsen, 2003). For effective integration of instructional technology to happen, teachers need professional development that is timely, ongoing (Zucker & Light, 2009) and focuses on coaching, individualized instruction, observation of instructional technology in practice and learning directed by each individual (Cakir, 2012; Flanagan & Jacobsen, 2003). A Donovan, Hartley and Strudler (2007) study of a middle school 1:1 initiative found that teacher professional development should not only be relevant and meaningful, but differentiated.

Banoglu's (2011) research discovered that teachers need a chance to discuss their use of technology in the classroom with others, and teachers need to be able to reflect, observe and study sound pedagogy that utilizes technology. Chang (2012) found this type of professional development leads to further use of technology in the classroom, therefore increasing academic performance. Many times teachers gather ideas for technology use from informal conversations with their peers (Dexter, 2011). In order for these type of conversations to occur, a professional community needs to be in place. Dexter, Seashore, & Anderson (2002) found that there is a reciprocal effect between professional communities and technology integration.

Surveys have found that instructional technology professional development has sometimes focused on the wrong topics. Flanagan and Jacobsen (Flanagan & Jacobsen, 2003) found that technology professional development often focuses on acquiring computer application skills, rather than focusing on technology integration skills and utilizing technology for project-based learning. Many teachers reported that in order for the professional development to be the most helpful, it should focus on helping teachers integrate technology into their instruction (Harris & Smith, 2004). In a 1:1 setting, this professional development also needs to focus on helping teachers "leverage unique pedagogical capabilities within a 1:1 environment" (Dunleavy, et al., 2007, p. 450) Some of the 1:1 professional development that has been extremely effective in transforming instruction in classrooms has focused on helping teachers become more "student centered" (Valiente, 2010).

The Flanagan and Jacobsen (2003) study showed the importance for principals to not only organize these trainings, but also participate in the professional development alongside the teachers. This participation by the administration played an important part in communicating the value of the trainings to the rest of the staff. Flanagan and Jacobsen (2003) explained that the school under study took the professional development further by providing a once a week common planning time for each grade level team and the technology lead teacher. These meetings built confidence in the teachers and allowed them to cooperatively create lessons that incorporated instructional technology together.

Support Systems for Principals

Even though much of the literature reviewed mentioned the importance of the principal in the integration and utilization of technology, the literature also referenced the importance of

providing the principal adequate support to be able to lead teachers in integrating instructional technology. The Cuban et al. (2001) study found that the reason technology innovations do not take flight in many school districts is because of the lack of professional development provided for principals. Ely (2008) discovered that principals felt their own professional development was essential for them to be effective leaders in curricular reform involving technology. Zucker and Light (2009) agreed with the other researchers and presented evidence that principals need to be trained and supported, just like teachers. Researchers found that principals had difficulties leading in the area of ICT when they were not familiar with how to integrate instructional technology and professional development was a key piece to developing these skills (Flanagan & Jacobsen, 2003; McGraw & Kearney, 2009).

In a study of the integration of technology in Ireland, McGraw and Kearney (2009) found that principals were very opinionated about needing high quality technical support from the district. Some school districts have established this as a school position and referred to the position as an IT Coordinator. Fakir (2012) found this position called many different names in his studies, including an information and technology expert, computer coordinator, and a media expert. Regardless of the name, this "technology expert" assists principals in their technology leadership roles and the everyday technology needs of the school. The technical support does is a resource to help support computers, printers, networks, software and other components (Zucker & Light, 2009). Hew and Brush (2007) mentioned that lack of technology support could be a barrier that affects a school's technology integration process.

Theoretical Framework

In order to effectively research the topic of 1:1 principal leadership, a theoretical framework is needed to guide the study. Merriam (2009) defined a theoretical framework as "the underlying structure, scaffolding or frame of one's study" (p. 66). Anfara and Mertz (2006) claimed that a theoretical framework has the ability to: "focus a study, reveal and conceal meaning and understanding, situate the research in a scholarly conversation and provide a vernacular and reveal its strengths and weaknesses." Thus the selection of this study's theoretical framework was a key component of this study.

Throughout my research on the topic of instructional leadership and 1:1 initiatives, one particular theme or structure was prevalent. Multiple studies supported the idea that in order for a principal to effectively lead, support and influence the implementation of instructional technology, the principal must take on multiple roles (Anderson & Dexter, 2005; Bangle, 2011; Flanagan & Jacobsen, 2003; ISTE, 2009; McGraw & Kearney, 2009). The idea of taking on multiple roles is congruent with the identity theory.

There are various definitions of identity that exist. Some use identity to describe the culture of a group of people and others use it to describe a person's identification with a social category. However, when referring to identity theory, Burke and Reitzes (1981) defined identities as the "meanings one attributes to oneself in a role (and others attribute to one)" (p. 286). Stryker and Burke (2000) believed "persons have as many identities as distinct networks of relationships in which they occupy positions and play roles" (p. 286). In explaining the framework of identity theory, there are many important factors to consider including: the multiple roles played by a person, the hierarchy and salience that determine which role a person

invokes, identity and its relationship to behavior, and identity and its impact on performance. The following categories introduce role identity topics that will be used to frame the study.

A person's self-identity is multifaceted and made up of many conflicting, yet reinforcing parts and multiple independent and interdependent parts (Stryker & Burke, 2000). A person learns multiple identities and they have to play numerous roles in society because of the expectations placed on them by their social environment. An example is a man could play the role of a husband, father, friend, teacher and provider. A person generally manages various identities and "the greater the number of related identities, the greater the difficulty of dealing with relationships among them" (p. 292). The most difficult part is that an individual faces numerous competing demands, roles and expectations from other people and these make up the whole identity of a person. An often-cited example of multiple roles is that of a working mother who has to face the conflicting role demands of work and family (Stryker & Burke, 2000).

When a person has to deal with numerous conflicting identities, a hierarchy is naturally formed. Stets and Burke (2003) felt that there were two types of identity hierarchies. The two types were prominence hierarchy and salience hierarchy. Prominence hierarchy focuses on what an individual values. To illustrate prominence hierarchy, we could consider the fact that a female teacher may value her role as a mother over her role as a teacher. In this example the females' identity as a mother is higher in her prominence hierarchy than her identity as a teacher.

The other type of hierarchy, salience hierarchy, refers to how a person will likely behave in a particular situation. Stryker and Burke (2000) explained that "the higher the salience of an identity relative to other identities incorporated into the self, the greater the probability of behavioral choices in accord with the expectations attached to that identity" (p. 286). Stryker

and Burke believed that certain identities could be more salient at any moment in time and have more power and significance than others. Another way to think of salience is that it is "the extent to which specific identity information dominates a person's working memory" (Bhattacharya & Sen, 2003, p. 82). Burke and Reitzes (1981) explained the salience hierarchy by saying:

> Those identities at the top of the hierarchy are more likely to be invoked than those at the bottom, and to be invoked in more situations, and to be invoked together with other identities lower in the hierarchy; those identities at the top of the hierarchy act to organize and order identities lower in the hierarchy" (p. 19).

To summarize, ultimately the more salient an identity is, the more likely that person is to call upon that identity in various situations.

In Identity Theory, a standard of behavior is established based on a person's identity and the expectation associated with that identity (Stryker & Burke, 2000). These standards guide behavior and a person will attempt to change their behavior to make it consistent with the expectations associated with their identity. Burke and Reitzes (1981) elaborated on behavior and identity by claiming that the relationship between identity and behavior is "complex and reciprocal" (p. 83). In a sense this relationship between behavior and identity is two-way because identities have a strong influence on the choices a person makes and by acting along with the expectations of their particular identity, a person reinforces that identity.

If an individual's behavior aligns with the expectations of their identity, identity congruence is achieved. Identity congruent behavior results in positive emotions and can even lead to increased self-efficacy about one's performance (Stryker & Burke, 2000). Self-efficacy

can be an important effect because it means that the person sees himself or herself as competent and capable. If a person's behavior does not align with the expectations of their identity, then an identity incongruent situation results. The identity incongruence leads to negative emotions (Stets & Burke, 2003) and this can even provide the person with motivation to change their behavior to better meet the identity expectations.

While research shows that school principals can impact the effective use of technology in the classroom, role identity theory helps us better understand the various "roles" a principal must play as a leader of instructional technology. This research study attempts to explain *how* a school principal leads, supports and influences a 1:1 initiative, by seeking to understand the roles a principal takes on and the detailed behaviors and expectations that are a part of these roles. The study will also attempt to explain the leaders' identity hierarchy and salience of these roles throughout the 1:1 implementation. This design will help decipher which of the principals' identities take precedence throughout the implementation. By studying the staff's perceptions of the principal's efforts during the implementation, the study also seeks to explain how the staff's expectations of the principal's roles and actual behaviors relate. By approaching the research study with this perspective, the intent is to help readers understand in more detail the roles and identities a principal must assume in order to lead an effective 1:1 initiative.

Conclusion

The review of literature began by discussing the history of instructional technology and when instructional technology was first introduced to the classroom. Since then there has been a massive increase in school technology spending. Research has shown that this has led to more computers in the classroom, but has not necessarily meant that computers are used more in

instruction. Cuban et al's (2001) study found that while students had greater access to technology, the actual use of technology and presence of technology continued to widen. Even when computers are used and integrated into instruction, this looks very different based on the technological proficiency of the teacher. The literature showed that the effects of integrating technology in the classroom could be immense. The research demonstrated that technology integration has the potential to engage students, change the roles of teachers and students, and make learning more natural and inquiry oriented.

The literature review discussed the recent emergence of one-to-one programs and described the benefits of having a one-to-one ratio of computers in schools. The review detailed the history of modern day 1:1 initiatives and discussed their current popularity in both the US and other countries. Current research and statistics cited the amount of money that schools, districts, states and countries are spending in order to adopt 1:1 initiatives. Most current 1:1 initiatives have four critical features: the technology used, setting, implementation plan and goals and objectives (Zucker, 2004). The review listed the multiple ways that 1:1 initiatives can impact teaching, instruction and students. Numerous research studies that have found 1:1 initiatives to have a positive impact on test scores (Bebell, & Kay, 2010; Dunleavy & Heinecke, 2008; Dwyer, 1994; Fadel & Lemke, 2006; Grimes and Warschauer, 2008; Gulek and Demirtas 2005; Hayes and Greaves, 2013; Jeroski, 2003; Lowther et al., 2003; Mouza, 2008; Rosen & Manny-Ikan, 2011; Schwarz, 2012; Shapley et al., 2010; Silvernail, 2008; Suhr et al., 2010). These initiatives can also have intermediate outcomes, such as decreased absences, a reduction of discipline problems, increased parental involvement, and increased student engagement and motivation. However, some studies have shown the negative side of these initiatives and

claimed that these initiatives are so costly and have so little impact on student achievement that some districts are dropping their 1:1 programs altogether.

The research supported the claim that a school principal is a critically important figure in a school's integration of technology. In fact, multiple studies have shown that principal technological leadership correlates with a teaching staff's integration of technology (Anderson & Dexter, 2005; Chang, 2012; Shapley et al., 2010). In order for a principal to successfully lead a school in the integration of technology, the review found that the principal must take on various roles in order to lead the implementation effectively. While the review cited various studies that supported the importance of a school principal's leadership of instructional technology, there was a gap in the literature concerning principal leadership of 1:1 initiatives.

Several studies found that in order for a principal to effectively lead, support and influence the implementation of instructional technology, the principal must take on multiple roles (Anderson & Dexter, 2005; Banoglu, 2011; Flanagan & Jacobsen, 2003; ISTE, 2009; McGarr & Kearney, 2009). This idea aligns with Stryker and Burke's Identity Theory. The theory will help the researcher to frame the research by identifying multiple roles, further research the identity salience and hierarchy of those roles and study the impact each role has on a principal's behavior. The theoretical framework was critical in helping frame the literature review and research questions and will be helpful in determining the research methodology of the study in Chapter 3.

CHAPTER 3

METHODOLOGY

The purpose of this study was to examine how principals lead, support and influence the implementation of a one-to-one initiative. Another objective of the study was to examine teacher perceptions of principal's efforts to lead, support and influence the implementation of a one-to-one initiative in light of the principal's own perceptions of the efforts. This examination was guided by the following questions:

1. How do principals lead teachers in the implementation of a one-to-one initiative?
    a. How do principals support teachers in the implementation of a one-to-one initiative?
    b. How do principals influence teachers' use of technology in the implementation of a one-to-one initiative?
2. How does the staff perceive the principal's efforts to lead, support, and influence the teaching staff in the implementation of a one-to-one initiative?

This chapter describes the methodology that was used in this research. The chapter begins by describing the research design and the rationale for this design choice. The role of the researcher is discussed along with a description of the site and the participants. Finally, the data collection and analysis employed are provided. The chapter will conclude with an overview of the methods of verification applied to the data.

Design of the Study

To achieve the purpose of the study, this study used an exploratory multi-site case study approach. Creswell (2012) defined case study research by saying:

> It is a qualitative approach in which the investigator explores a bounded system (a case) or multiple bounded systems (cases) over time, through detailed in-depth data collection involving multiple sources of information (e.g., observations, interviews, audiovisual material and documents and reports), and reports a case description and case based themes. (p. 97)

In this study, the bounded systems were the schools adopting one-to-one initiatives.

Yin (2008) defined a case study "as an empirical inquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident" (p. 18). Yin (2003) claimed, "case studies are the preferred strategy when 'How' or 'Why' questions are being posed" (p.1). The study's research questions focused almost solely on the "How" and the descriptive nature of a case study was the most effective way to answer these questions. This study asked questions that appeared explanatory in nature, but because little research had been done on principal leadership of one-to-one initiatives, the study was more exploratory. Because the study was exploratory, the study was approached with the intent of gathering data to gain a better understanding of the phenomenon. Figure 1 serves as a visual model for this exploratory multi-site case study.

A case study is seen to have strengths that often outweigh its weaknesses. Merriam (2009) contests that a case study:

> Results in a rich and holistic account of a phenomenon. It offers insights and illuminates meanings that expand its readers' experiences. These insights can be construed as tentative hypotheses that help structure future research; hence, a case study plays an important role in advancing a field's knowledge base (p. 50).

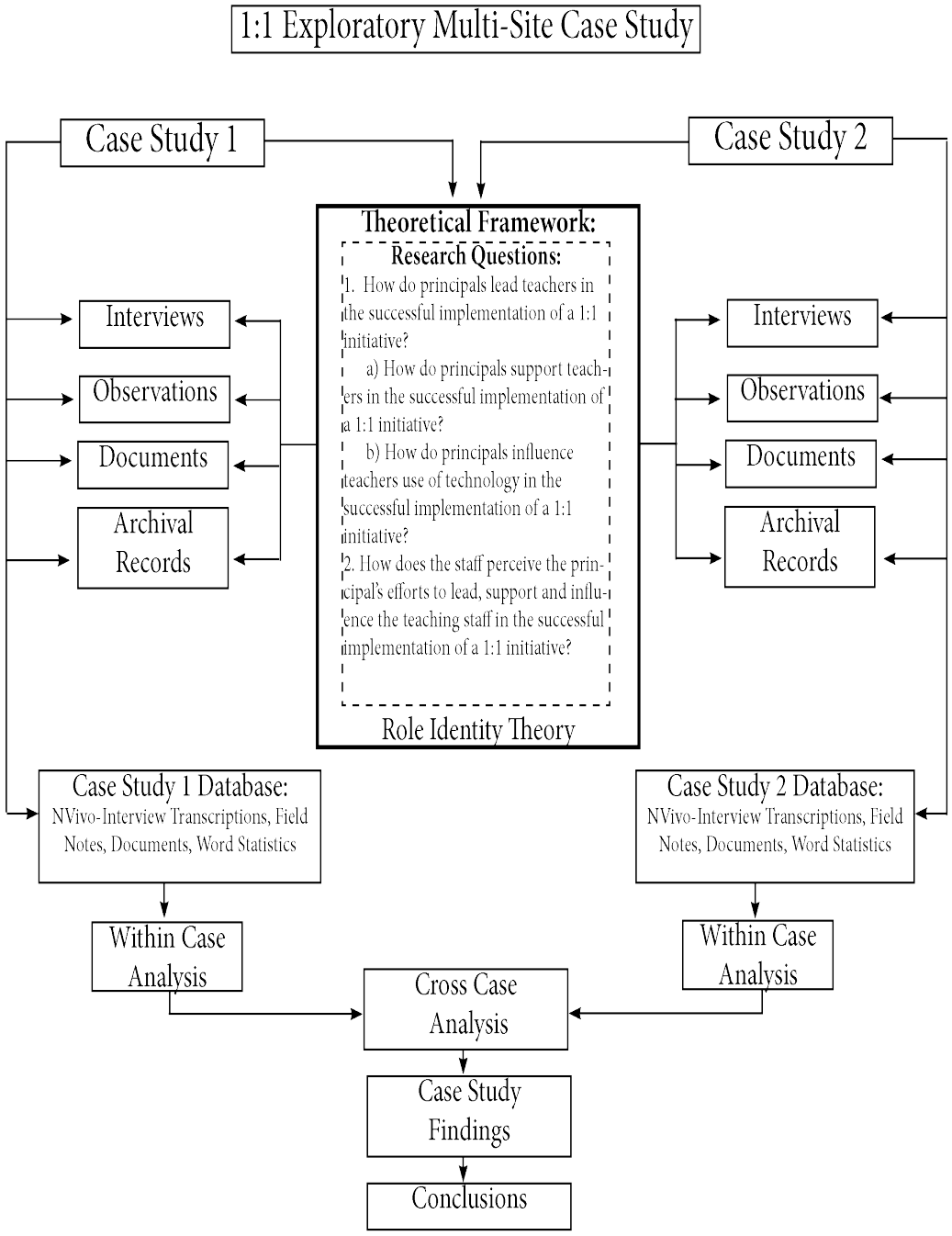

Figure 1: Visual Model for the Case Study

Yin (2003) believes that one of the biggest strengths of a case study is its ability to deal with a variety of evidence. In order to acquire rich and descriptive data, the researcher needed to look at a variety of sources, which is why the case study fit this particular study so well.

The biggest weakness of the case study is that it requires extensive resources and time and should not be taken lightly (Merriam, 2009; Yin, 2003). Even with these resources and time, it is very difficult to produce a strong case study. Part of this is because of the concerns of reliability, validity and generalizability. Sometimes the case study conductor can have a lack of rigor, have no systemic procedures, succumb to bias and even utilize equivocal evidence. Lin (2003) argues that this is true because there is a lack of texts that give specific directions like in other more common qualitative studies. The nature of a case study means to some that the results are not generalizable to populations or universes because it is an account of one or a few theoretical propositions. Finally, some case study critics will argue that they often take too long and result in large unreadable documents.

Rationale for the Design

There are various reasons why the researcher chose to utilize the case study approach to answer the study's research question. The research questions for this investigation capture the essence of a case study, which is to "illuminate a decision or set of decisions: why they were taken, how they were implemented and with what result" (Schramm, 1971, p. 21). The research questions focused on the specific leadership decisions that were necessary to lead, support and influence a one-to-one initiative and then captured the staff's perceptions of these decisions.

Case study design was chosen because the researcher was interested in "insight, discovery and interpretation rather than hypothesis testing" (Merriam, 2009, p. 42). The case

study allowed the researcher the opportunity to closely examine the principal's roles and gather descriptive data of how they lead, influence and supported these initiatives.

In particular, a multi-site case study was chosen so that the researcher could gain further insight into the leadership of one-to-one initiatives and compare and contrast the leadership efforts of two principals. Herriott and Firestone (1983) claimed that evidence from multiple cases is frequently seen as more compelling and therefore the overall study is seen as more robust. In fact multi-site case studies can often enhance the validity and generalizability of studies. Single site case studies are a little vulnerable because in a sense you put all of your "eggs in one basket" (Yin, 2003). Yin (2003) also claims that the analytic benefits from having two or more cases may be substantial (p. 53).

Qualitative Methods

The study utilized a qualitative approach instead of a quantitative approach because quantitative research often focuses more on determining the cause and effect or relationships of variables. Creswell (2014) defined quantitative research as "an approach for testing objective theories by examining the relationship among variables" (p.4). This study did not test any theories, but rather took a constructivist approach and sought to "explore and understand the meaning individuals or groups ascribe to a social or human problem" (Creswell, 2014, p. 4). In qualitative research, the researcher approaches the research through an inductive process of gathering data to build concepts, theories, or hypotheses instead of testing a previously developed hypothesis (Merriam, 2009).

The purpose of the study asked many "How?" questions, which can only be fully answered by a qualitative inquiry that is richly descriptive. These questions could not be

comprehensively answered by quantitative instruments, but rather needed multiple sources of data to exhaustively explore the research questions that were posed. A survey that produced quantitative data would not have provided the details and story necessary to fully understand the principals' ability to lead, influence and support a one-to-one initiative. Finally, to successfully collect these data a questionnaire or instrument would not suffice. The researcher must be relied upon as the key instrument in collecting data. The nature of this study's research questions could only be fulfilled through a qualitative study design that sought to understand and collect richly descriptive data. The researcher then is able to use multiple sources to better understand this leadership phenomenon.

Role of the Researcher

In qualitative research, "human beings are the primary instrument of data collection and analysis in qualitative research, interpretations of reality are accessed directly through their observations and interviews" (Merriam, 2009, p. 214). Merriam claimed that because there is little training readily available in observing and interviewing, nor are there guidelines in constructing the final report, the researcher often has to rely on instinct throughout the research study. Because the researcher is the key instrument in qualitative studies, bias is a potential problem in qualitative research that must be addressed (Creswell, 2014; Merriam, 2009; Yin, 2003). The researcher must be fully cognizant of any biases brought to the research. Therefore, I comprehensively evaluated any potential biases I had before beginning my research.

Throughout the course of the study, I was an assistant principal at an elementary school in its third year of implementing a one-to-one in initiative in grades three through five. Kindergarten, first and second grade also received a large influx of instructional technology in

their classrooms as well. Specifically, every student in grades four and five were given laptops, an iPad was provided for every student in third grade, ten iPads per classroom were provided in grades one and two, and Kindergarten classrooms received six iPads per classroom. This meant that similar to my research topic, while I collected data for this study, I was an assistant principal at a school that was implementing a one-to-one initiative. In my previous experience as a teacher, I was a classroom practitioner and strong advocate for the use of instructional technology in the classroom. While this may have limited my viewpoint during research, it also meant that I was more aware of the roles a principal may play when leading a one-to-one initiative. This experience and background allowed me to be more of an expert and observe and ask questions that quickly focused on the study's research questions. Shields (2007) argued that this is exactly what makes case study research so advantageous:

> The strength of qualitative approaches is that they account for and include difference—ideologically, epistemologically, methodologically—and most importantly humanly. They do not attempt to eliminate what cannot be discounted. They do not attempt to simplify what cannot be simplified. Thus it is precisely because case study includes paradoxes and acknowledges that there are no simple answers that it can and should qualify as the gold standard. (p. 13)

Yin (2003) argues that this bias naturally occurs in case studies because most researchers have a greater knowledge base and understanding of the issues that are being studied.

Throughout this study there were many steps I took to ensure that the study was not affected by my bias. To control for my bias, I relied upon the strength of a case study and utilized triangulation among other verification methods outlined later in this chapter. The use of

Stryker and Burke's (2000) theoretical framework of the Identity Theory throughout my study allowed me to further control for bias in my study and gave me a non-biased lens through which to interpret the data. Finally, throughout the research process I prioritized documentation of the procedures I followed. In this way, I could formulate a case study protocol for possible duplication of research in other schools implementing a one-to-one initiative. Through my verification methods, detailed documentation, and theoretical framework, I attempted to approach my research as if someone were always looking over my shoulder (Yin, 2003).

Site and Participants

Sites

This study utilized a non-probability purposeful sampling method. Merriam (2009) explained, "purposeful sampling is based on the assumption that the investigator wants to discover, understand and gain insight and therefore must select a sample from which the most can be learned" (p. 77). Lecompte and Preissle (1993) used the term criterion-based selection and concluded that you "create a list of the attributes essential to your study and then proceed to find or locate a unit matching the list" (p. 70). This method was utilized for this study, as I searched for schools in a southeastern state that were implementing one-to-one initiatives. While one-to-one initiatives are becoming more common across the nation, there still is a limited sample of schools adopting one-to-one initiatives in this southeastern state because of the cost associated with this phenomenon. This meant that I was using a unique sample, which constrained my search, but I still had specific criteria that I used as a guide.

My goal was to find two schools in the first full year of implementing a one-to-one initiative. Based on my two years of experience in a one-to-one school, I recognized that the

first year is a crucial year for the principal to lead, support and influence a one-to-one initiative. Studying the first year of a one-to-one initiative also allowed me to detail how the principals prepared and led the initiative before the one-to-one devices were ever given to teachers. I also sought two schools within the same district that were implementing one-to-one initiatives at the same time. This allowed minimum variability in district level leadership, policies, and professional development so I could focus solely on the leadership of the principal. Selecting schools from different districts would disallow control for how each district trained and supported their principals during the one-to-one implementation; thus it would be more difficult to focus on and measure the principal's decision-making and leadership ability. My preference was to focus on two schools at the intermediate school level, compare and contrast the leadership efforts at each school and gather the most helpful information that would assist a practitioner at the elementary, middle or high school level. Finally, the last qualification for the study was that the district would be willing to participate in my semester long study of their one-to-one implementation.

Based on my site search criteria, I selected Lake District schools as a prime target for my research study. According to the United States Census Bureau, the population of the city of Lake District in 2013 was 27,992. Lake District Schools at the time of the study, served 5,120 students. The district employed 400 teachers and 27 administrators and was a mixture of suburban and rural schools. All of the teachers in the Lake District schools were highly qualified, meaning that they all held at least a bachelor degree, were fully licensed by the state, and demonstrated competence in the core academic subject area or areas that they taught. Of the 400 teachers, 83% of them had an advanced degree beyond a Bachelor's degree. The Lake

District Schools student demographics are outlined in Table 1 and Student Achievement data is presented in Table 2. Lake District schools was an excellent match for my study because in the 2014-2015 school year the district began piloting a one-to-one program in two of their schools. A small collection of teachers in the district's seven schools implemented the technology in their classrooms during the pilot year. Even though the majority of teachers in the district did not introduce one-to-one technology in their classrooms in the 2014-2015 school year, all of the teachers in the district were provided with professional development that focused on topics concerning one-to-one technology during the 2014-2015 school year. For the 2015-2016 year, all seven schools in the district implemented a one-to-one program. The three kindergarten through third grade schools implemented one-to-one technology in the second and third grades, while the intermediate schools, junior high, and high school implemented one-to-one technology in all of their grade levels.

This study was a multi-site case study and based on my site criteria that I outlined, I chose to study two of the district's two intermediate schools, Naboo Intermediate School, and Endor Intermediate School. Both Naboo Intermediate School and Endor Intermediate School contained grades four, five, six and seven. Studying intermediate schools meant that each student in both schools would have their own device, which in turn indicated that the principal would have to lead all students and staff in the implementation of the initiative. The choice to study two intermediate schools was based on the possibility of both schools producing a "literal replication" of one another. According to Yin (2014), each case in a case study "must be carefully selected so that it either predicts similar results (a literal replication) or predicts contrasting results, but for anticipatable reasons (a theoretical replication)" (p.57). In the

Table 1

Comparison of Student Demographics: 2015-2016 Data

Student Ethnicity & Demographics	**Lake District Schools District**	**Naboo Intermediate School**	**Endor Intermediate School**
Race			
White	87.2%	87.5%	87.0%
Black or African American	4.8%	6.2%	4.9%
Hispanic or Latino	4.7%	4.5%	3.5%
Asian	3.0%	1.7%	4.1%
Native American/Alaskan or Other	0.3%	0.1%	0.5%
Demographics			
English Language Learners	3.3%	1.6%	3.1%
Economically Disadvantaged	19.4%	21.1%	18.2%
Students With Disabilities	12.9%	14.2%	12.8%

Table 1 (continued)

Student Ethnicity & Demographics	**Lake District Schools District**	**Naboo Intermediate School**	**Endor Intermediate School**
Total Student Enrollment	5,132	754	797

Table 2

Comparison of Student Achievement: 2014-2015 Data (No TCAP in 2015-2016)

Subjects	Lake District Schools District	Naboo Intermediate School	Endor Intermediate School
3-8 Reading Language P/A	69.6%	70.7%	74.4%
3-8 Math P/A	72.5%	68.7%	75.3%
3-8 Science P/A	87.0%	86.6%	87.4%
3-8 Social Studies P/A	No Data for 14-15	No Data for 14-15	No Data for 14-15

Note. P/A = Percent of Students who are Proficient or Advanced on the Tennessee Comprehensive Assessment Program (TCAP)

example of this muti-site case study, the more similarities the schools shared, the better the study would be. The reasoning being that if both schools served relatively homogenous student populations and both schools had similar district support, training and professional development, then it would make it easier for the researcher to understand how the school principals led, influenced and supported their school's one-to-one initiative. Because of the similarities between the schools, any semblance in leadership findings could help identify the particular roles a principal must play in order to lead a one-to-one implementation. The decision to not study the kindergarten through third grade elementary schools was based on the fact that the schools were only implementing one-to-one technology in two of the four grade levels. The Junior High and High School were not studied because of how different the use of instructional technology is at the secondary level and because of the researcher's desire to study schools with students below ninth grade. Table 1 and 2 outline the student demographics and achievement data of the two intermediate schools compared to the district numbers.

Participants

Site participants at each school included the principal, assistant principal, technology coordinator or technology support teacher and a purposive sampling of teachers at each school. The study used purposive sampling at the school level to ensure that the study interviewed teachers at various levels of technology proficiency and experience. This was important to measure the effectiveness of the principal's leadership, influence and support to all types of teachers. Teacher interviewees were identified through interviews with the principals, assistant principals and other teachers as well as observations. The choice to utilize observations, allowed the researcher an opportunity to identify teacher participants with various technology proficiency

levels and attitudes toward the initiative. Purposive sampling was used rather than random sampling because of the importance of garnering a wide variety of responses, so that the principal's instructional leadership could be studied from various angles.

At Naboo Intermediate School and Endor Intermediate School, the principal and assistant principals were interviewed 3 times throughout the semester. The principal and assistant principals were interviewed at the beginning of the semester in September, during the middle of the semester in early November and in December at the end of the semester. The reason the principal and assistant principal were interviewed at three separate times during the semester was to collect data that represented the principals and assistant principals' leadership efforts over the entire semester. The three separate interviews enabled the researcher to detail different roles the principal and assistant principal took on and how those roles and responsibilities changed over the course of the semester. The technology coordinator and technology support teacher were interviewed twice during the semester, once in September and once in December. The reason the technology coordinator and technology support teacher were only interviewed twice as opposed to three times was because the main focus of the study was on the principal's efforts in leading, influencing and supporting the implementation of a one-to-one initiative. However, interviewing the technology coordinator and technology support teacher was still a very important part of the study and thus interviewing them various times allowed the researcher to have multiple contact points with participants that were very familiar with the principal's leadership efforts and the overall subject of instructional technology. Interviewing the technology coordinator and technology support teacher twice at the middle and end of the semester, provided the researcher with an opportunity to discover whether or not the technology

coordinator's and technology support teacher's perceptions of the principal's efforts changed over the course of the semester. Since the teachers were only interviewed once at the end of the semester, the researcher used the first two interviews with the principal and assistant principals, the first interview with the technology coordinator and technology support teacher and various observations including various staff meetings, professional learning communities (PLCs), professional development sessions and classroom observations, to identify a purposive sampling of teachers with various instructional technology proficiency levels. Based on the interviews and observations, the researcher chose four teachers to interview at each school. Once the four teachers were selected, the researcher approached each teacher in person to ask for permission to interview them. Once I received permission to interview the teachers, I scheduled an interview for the next time I was at the school. At both Naboo Intermediate School and Endor Intermediate School, one fourth grade, one fifth grade, one six grade, and one seventh grade teacher with varying instructional technology proficiency levels were chosen. I attempted to select teachers who taught a variety of the core sujects, like reading, language arts, math, science and social studies.. The particular participants were selected because the researcher sought to interview a wide variety of teachers and represent each grade level and various backgrounds through the teacher perception interviews.

Data Collection

After the two sites were chosen and the IRB form was submitted and approved by the University of Tennessee, the data collection process began for the study. Yin (2003) noted that qualitative case study data comes from six important sources: interviews, direct-observation, participant observation, documentation, archival records and physical artifacts. As outlined

below, this particular study utilized interviews, observations, documents and archival records to present a comprehensive and richly descriptive case study supported by multiple sources of evidence. Merriam (2009) believed that a study's theoretical framework impacts all aspects of a study including the data collection strategies. Thus the identity theory played an integral part in the development of the study's data collection methods.

Interviews

DeMairrais (2004) defines an interview as "a process in which a researcher and participant engage in a conversation focused on questions related to a research study" (p. 55). Patton (2002) identified the purpose of interviewing as finding out from the respondent the things we cannot observe and enter into the other person's perspective. In this study a semi-structured interview protocol was used to interview the principals, assistant principals, technology coordinator, technology support teacher and teachers. Rubin and Rubin (2004) believed a case study interview is more likely to be fluid rather than rigid. This type of semi-structured interview was chosen so that the:

> Largest part of the interview was guided by a list of questions or issues to be explored, and neither the exact wording nor the order of the questions was determined ahead of time. This format allowed the researcher to respond to the situation at hand, to the emerging worldview of the respondent, and to new ideas on the topic (Merriam, 2009, p. 90)

In actuality even if interview questions are semi-structured, Merriam (2009) believes that researchers may have to employ structured, semi-structured and unstructured interviewing methods at times so that fresh insights and new information can emerge. Throughout the

interview process probes were used in the interviews to seek clarity or more information about what the participants said. Glesne and Peshkin (1992) shared that "probes may take numerous forms; they range from silence, to sounds, to a single word, to complete sentences" (p.85).

During the creation of the interview questions, the researcher utilized the identity (1980, 2004) theoretical framework as a guide and sought to develop questions that would answer the research questions of the study. Table 3 provides a summary of how each particular interview question relates to the study's research questions. The interview questions created were based on Patton's (2002) six types of questions: experience and behavior questions, opinions and values questions, feeling questions, knowledge questions, sensory questions and background/demographic questions. As the interview questions were created, the researcher kept Merriam's (2009) advice in mind that "good interview questions are those that are open ended and yield descriptive data, even stories about the phenomenon (p. 99).

The researcher initially created a number of interview questions for each participant with the intention of using feedback from instructional technology experts and qualitative interview experts to improve the wording of the questions and eliminate any poorly written or unnecessary questions. In the first iteration of the questions, the researcher submitted 21 principal, 25 assistant principal, 22 curriculum coach and 22 teacher interview questions to four instructional technology and interview process experts. The questions were submitted to two instructional technology experts and two qualitative interview experts. The feedback was helpful and the researcher was able to reflect on the expert advice and improve the overall effectiveness of the interview questions. The advice from experts helped the researcher to add pertinent sub questions, highlight particular key words, eliminate repeated questions and improve the overall

Table 3

Research Question in Relation to Data Collection Sources

Research Question	**Interview Question**
1. How do principals lead teachers in the implementation of a one-to-one initiative?	P3, P4, P6, P7, P9, P12, P13, P14, P15, P16, P18, P19, P20, AP3, AP4, AP6, AP7, AP9, AP12, AP13, AP14, AP15, AP16, AP18, AP19, AP24, AP25, CC6, CC7, CC9, CC12, CC13, CC14, CC15, CC16, CC19, CC23, CC24, T6, T7, T9, T12, T13, T14, T15, T16, T19, T21, T22
a. How do principals support teachers in the implementation of a one-to-one initiative?	P3, P4, P6, P7, P8, P10, P12, P13, P14, P15, P16, P17, P18, P19, P20, AP3, AP4, AP6, AP7, AP8, AP10, AP12, AP13, AP14, AP15, AP16, AP17, AP18, AP19, AP20, AP24, AP25, CC6, CC7, CC10, CC12, CC13, CC14, CC15, CC16, CC17, CC19, CC23, CC24, T6, T7, T8, T10, T12, T13, T14, T15, T16, T17, T19, T21, T22

Table 3 (continued)

Research Question	Interview Question
b. How do principals influence teachers' use of technology in the implementation of a one-to-one initiative?	P3, P4, P6, P7, P11, P12, P13, P14, P15, P16, P18, P19, P20, AP3, AP4, AP6, AP7, AP11, AP12, AP13, AP14, AP15, AP16, AP18, AP19, AP24, AP25 , CC6, CC7, CC11, CC12, CC13, CC14, CC15, CC16, CC19, CC23, CC24, T6, T7, T11, T12, T13, T14, T15, T16, T19, T21, T22
c. How does the staff perceive the principal's efforts to lead, support, and influence the teaching staff in the implementation of a one-to-one initiative?	AP6, AP7, AP12, AP24, AP25, CC7, CC9, CC10, CC11, CC12, CC14, CC15, CC16, CC17, CC18, CC19, CC20, CC23, CC24, T6, T7, T8, T9, T10, T11, T12, T13, T14, T15, T16, T17, T18, T19, T20, T21, T22

Note. P=Principal; AP=Assistant Principal; CC= Curriculum Coach; T=Teacher

wording of the questions. The decision to solicit feedback from both qualitative and instructional technology experts enabled the researcher to better understand how to improve both the formatting of the questions and the content of the questions.

After the researcher reflected on the expert feedback, a final interview protocol was designed for 1) principals 2) assistant principals, 3) curriculum coaches/technology coordinators /technology support teachers, and 4) teachers. All four of these final interview protocols can be

found in Appendices A, B, C & D. The final interview protocols consisted of 20 principal questions, 25 assistant principal questions, 24 curriculum coach questions and 22 teacher questions. The assistant principal, curriculum coach/technology coordinator/technology support teacher and teacher interview protocols mostly mirrored the principal interview protocols in order to fully understand the staff's perceptions of the principal's leadership efforts and compare them to the principals' perceptions of their own leadership efforts. During the interviews, the order of the questions asked depended on the natural flow of each interview.

Final Interview Protocol

Once the interview questions were piloted and finalized, the interviews were conducted at Naboo Intermediate School and Endor Intermediate School with 17 total participants and 32 total interviews. One principal, two to three assistant principals, one curriculum coach/technology coordinator/technology support teacher and four teachers from various grade levels were interviewed at each school. When conducting interviews, a researcher's goal is to reach saturation, where collecting new data no longer adds to the study (Creswell, 2014). Guest, Bunce and Johnson's (2006) study found that 12 interviews were enough to reach saturation in a qualitative purposive study of fairly homogenous participants. The principals and assistant principals were interviewed three times during the semester, at the beginning, middle and end of the semester, using the same protocol. Principals and assistant principals were interviewed three times over the semester, in order to better understand the principal's efforts and progress in leading, supporting and influencing the implementation of their school's 1:1 initiative. The three interviews also helped the researcher to better understand the leadership efforts utilized over the entire semester as opposed to just the beginning or end of

the semester as well as the progress of these efforts. The curriculum coach or technology coordinator or technology support teacher were interviewed twice, once at the beginning of the semester and once at the end of the semester. The curriculum coach or technology coordinator or technology support teacher were interviewed twice because they were more involved in the leadership of the implementation of the initiative than the teachers, but less involved than the principal and assistant principal. The four teachers at each school were only interviewed once at the end of the semester for a total of eight teacher interviews. The reason the end of the semester was selected to interview teachers was so the teachers had a whole semester of experience and evidence before reflecting on their principal's leadership efforts. All participants in this study were interviewed during their planning periods or after school hours, and each interview lasted no longer than 45 minutes unless approved by the interview participant. Some notes were taken on the computer during the interviews and each interview was recorded and then verbatim transcribed at a later time. Each participant gave the researcher permission to conduct and record the interviews.

Direct-Observation

The research study relied upon direct-observations to glean additional data. Observations are different than interviews because, "observations take place where the phenomenon of interest naturally occurs and second they represent a firsthand encounter with the phenomenon of interest rather than a secondhand account of the world obtained in an interview" (Merriam, 2009, p.117). Observations were included because it allowed the observer to see the principal in action, enabled the researcher to observe how the principal leads, supports and influences their school's one-to-one initiative and observe how the teacher's respond to these leadership efforts.

In this study the researcher took on the role of a non-participant observer. Creswell (2012) defined this role "as the outsider of the group under study, watching and taking field notes from a distance" (p. 167). The times for the observations were set after the researcher spent some time in the school buildings and spoke with the school staff about what times and places would be best to observe the leadership efforts of the one-to-one initiative. After meeting and receiving approval from the principals, the researcher shadowed the principal and observed various staff meetings, administration meetings, leadership team meetings, parent organization meetings, professional learning communities (PLCs), professional development sessions and classroom observations.

Time spent shadowing the principal helped the researcher see how the principal specifically led, supported and influenced their one-to-one initiative on a daily basis. The staff meetings were chosen to observe the principal's leadership efforts in these meetings and observe how they related to the principal's leadership of the one-to-one initiative. The administration meetings enabled the observer to see how the administrative team worked together to make decisions related to the initiative. The observation of leadership team meetings allowed the observer to witness how involved staff members and students were with the leadership of the implementation of the initiative. Parent organization meeting gave the observer the opportunity to see how the principal engaged families and the community in the initiative. Time spent in PLCs provided the researcher with an opportunity to see how the collaborative efforts of various grade levels related to each school's one-to-one initiative and principal's leadership of the initiative. The professional development sessions that were attended focused on the school's one-to-one implementation efforts and allowed the researcher to see the principal's role in

planning, presenting and attending these sessions. The classroom observations helped the researcher to gauge how the principal's leadership efforts were impacting classroom instruction. The various observations helped the researcher to learn more about the school's climate and even helped in the development of additional probes and interview questions that were more specific to each school. Throughout the observation process, the research questions and the theoretical framework were a guide that helped focus the researcher's observations.

During the observations the researcher took field notes, which Merriam (2009) claimed are very similar to an interview transcript. The researcher created and used an observation protocol that can be found in Appendix E. The protocol was used to guide and focus the researcher's observations and helped the researcher to attribute particular observation notes with the different roles principals play in leading instructional technology as detailed in Chapter Two. The researcher was highly reflective in these field notes by including descriptions, quotations, and observer comments.

Documents and Archival Records

Merriam (2009) refers to the term document as the "umbrella term to refer to a wide range of written, visual, digital, and physical material relevant to the study at hand" (p. 139). Yin (2003) felt that the biggest advantage of these documents was that they helped corroborate and augment the evidence obtained from other sources. They also allowed the researcher to make inferences and turn these inferences into clues that could be explored in the other sources. Yin (2003) expressed that the weakness of using documents is that they cannot be over relied upon and the researcher must keep in mind that the documents are normally created for a purpose and audience other than the ones being studied for the case study.

The documents used for this study were staff meeting agendas and handouts, PLC agendas and handouts, monthly newsletters, weekly principal emails, parent newsletters, staff handbooks, administrator walkthrough notes, professional development handouts, screenshots of various parts of the school's website and other assorted documents that were distributed or created by the principals. All of these documents were used in the study to identify how the principal led, influenced and supported teachers in the implementation of a one-to-one initiative. The various array of documents helped the researcher to gain insight about the principal's leadership of their initiative. The researcher did not examine an exhaustive collection of the semester's documents, but rather collected a selection of documents that he felt could give insights regarding leadership efforts in relation to the one-to-one initiative that occurred when the researcher was not physically in the building.

The only archival records used for the study were school budgets and PTA budgets. The researcher was only able to acquire school budget information from one of the two schools. The researcher used the budgets to identify specific technology spending at the school level to learn more about the principal's management of instructional technology spending.

Data Analysis

Data analysis in its simplest definition is the process of making sense out of data. Merriam (2009) described it as "a complex process that involves moving back and forth between concrete bits of data and abstract concepts, between inductive and deductive reasoning, between description and interpretation" (p. 176). Yin (2003) and Merriam (2009) claimed that the analysis of case study evidence is one of the most difficult aspects of conducting a qualitative study.

One of the first steps the researcher took was creating what Yin (2009) calls a case study database. As shown in figure 1, the researcher constructed a separate case study database for each school. The researcher used NVivo 11.3.2 for Mac, a qualitative data analysis software, and Evernote 6.10, a software program designed for note taking and archiving, to bring together all of the interview logs, field notes, reports, records, documents, archival records, pictures, website screenshots and reflective memos. Audio recordings were made of all of the interviews, transcribed into verbatim interview logs using the Dragon Dictation software, Inqscribe software and Microsoft Word, and then entered into NVivo. The remaining documents were also inserted into the NVivo software program. These case study databases were crucial so that the researcher could locate specific data during intensive analysis (Merriam, 2009). Once the study was completed and the database was organized, the researcher used word statistics, or a word frequency count in NVivo, to identify any words that were used regularly throughout the study. This word frequency count informed the researchers coding efforts and made him more cognizant of potential codes that may emerge throughout the data analysis.

Creswell (2014) clarified that the "qualitative data analysis process is unlike quantitative research in which the investigator collects the data, then analyzes the information, and finally writes the report" (p. 195). In fact data analysis is "one of the only facets of doing qualitative research in which there is a preferred way" (Merriam, 2009, p. 171). This preferred way is analyzing the data simultaneously while collecting the data. While in the process of collecting data, I began to review the data, allowing me to better identify patterns and ask follow up questions that solidified themes in the data. This process also allowed me to constantly reflect

and adjust interview questions to better understand how the participants' responses related to the study's research questions.

Once the data collection process began and the case study database was initially formulated, the simultaneous analyzing of the data led to the process of coding. Merriam (2009) defined coding as "nothing more than assigning some sort of shorthand designation to various aspects of your data so that you can easily retrieve specific pieces of data" (p. 173). Creswell (2012) recommended aggregating the data into around five to seven themes. The researcher used the study's research questions, Stryker and Burke's (2000) Role Identity theoretical framework and the chapter 2 literature review to create twelve a priori roles that represented the research based roles that principals take on when leading, supporting and influencing an initiative. The twelve a priori roles were used as themes to help guide and support the coding process. During the coding phase, codes that developed were sorted into these twelve a priori themes whenever possible. Some of the codes that did not align with the twelve a priori themes were combined to create a new thirteenth role and theme.

Because the study was a multiple case study, there were two stages to the analysis: the within-case analysis and cross-case analysis. "For the within-case analysis, each case was treated as a comprehensive case in and of itself. Data were gathered so that the researcher could learn as much about the contextual variables as possible that might have a bearing on the case" (Merriam, 2009, p. 204). The researcher conducted a within-case analysis by coding the information for each school. The researcher was able to do analyze both intermediate schools individually and identify codes and themes for each site.

Once the within-case analyses were finished, a cross-case analysis was conducted to build abstractions and theories across cases (Merriam, 2009). The researcher was able to identify codes and themes that developed across both intermediate schools to help answer the research questions and provide a broader answer to how a principal leads, influences and supports the implementation of a one-to-one initiative. The cross-case analysis also gave the researcher an opportunity to identify differences in the leadership of each school and analyze how those differences impacted the leadership of each one-to-one initiative. The process of comparing and contrasting between two cases added to the power of the study.

Verification Methods

As Merriam (2009) tells us, "all research is concerned with producing valid and reliable knowledge in an ethical manner" (p. 209). In fact, Merriam goes on to say that, "the applied nature of social science inquiry makes it imperative that researchers and others have confidence in the conduct of the investigation and in the results of any particular study" (p. 210). While proving the validity of a qualitative research study is very different than proving a quantitative study's validity, Creswell (2012, 2014) believes that validation is a strength of qualitative research. The researcher demonstrated the validity of this study through providing a rich, thick description, conducting a multi-site study, triangulation of the data, and supplying an audit trail.

Rich, Thick Description

Creswell (2014) claimed, "using a rich, thick, description to convey findings can transport readers to the setting and give the discussion an element of shared experiences" (p. 202). The various sources of data including, interviews, observations, documents and archival

records, along with the extensive amount of time the researcher spent in the school, provided the study with a very rich description, which added to the validity of the study.

Multi-Site Case Study

Miles and Huberman (1994) wrote "By looking at the range of similar and contrasting cases, we can understand a single-case finding, grounding it by specifying how and where and, if possible, why it carries on as it does. We can strengthen the precision, the validity and the stability of the findings" (p. 29). Because the study compared and contrasted the findings across two schools, the findings were more detailed and helped add to the validity of the study.

Triangulation of Data

Yin (2003) argued that there are three principles that must be followed when collecting case study data: use multiple sources of data, create a case study database and maintain a chain of evidence. The major strength of case studies is that they allow for multiple types of evidence, which helps triangulate the data. Yin (2003) believes that when you truly triangulate the data, the data you collect is supported by more than just one single source of evidence. The researcher was able to look across interviews, observations, documents and archival records to establish codes and themes in order to add to the validity and credibility of the study.

Audit Trail

An audit trail "describes in detail how data were collected, how categories were derived, and how decisions were made throughout the journey" (Merriam, 2009, p. 223). Merriam compares a study's audit trail to what a ship uses to detail its journey. Thorough documentation records were recorded during each of the data collection efforts of this study. Software programs and audio recordings were used to add to the detailed case study database. Clear data collection

protocols were followed so that a chain of evidence was maintained well enough that an external observer could trace the steps of the research in either direction. The researcher also kept a research journal during this data collection process, to help readers better understand how the study was conducted and analyzed. These steps were taken because an external observer should "be able to move from one part of the case study process to another, with clear cross-referencing to methodological procedures and to the resulting evidence. This is the ultimate chain of evidence that is required" (Yin, 2003, p. 105).

Member Checks

A study can receive additional validity if member checks are performed during the study. Creswell (2014) describes member checking as the process of "taking the final report or specific descriptions or themes back to the participants and determining whether these participants feel that they are accurate" (p. 201). After the data collection phase,the researcher sent the interview transcriptions to each individual participant to ensure their accuracy. The participants verified the accuracy of the transcriptions and provided additional comments that helped the researcher continue to adjust any mistakes in the transcriptions. Maxwell (2005) claimed that member checks are:

> The single most important way of ruling out the possibility of misinterpreting the meaning of what participants say and do and the perspective they have on what is going on, as well as being an important way of identifying your own biases and misunderstanding of what observed. (p. 111)

This process of taking my initial analysis of the data back to participants was valuable as it allowed me to decipher whether my transcription of the data "rang true" with the respondents (Merriam, 2009).

Conclusion

To achieve the purpose of this study and detail how a principal leads, influences and supports the implementation of a one-to-one initiative, a multi-site case study approach was utilized to better understand the phenomenon. The multi-site case study was chosen because it helped "illuminate a decision or set of decisions: why they were taken, how they were implemented and with what result" (Schramm, 1971, p. 21). The case study involved two intermediate schools and interviewed a total of 17 participants. Besides interviews, the study also utilized observations, documents and archival records to explore the research questions. The data analysis began during the data collection process and continued once all data was collected. The study incorporated multiple verification methods such as rich, thick description, multi-site study, triangulation of data, and an audit trail, to validate the data collected. Chapter 4 will address the results of data analysis from each case study and then a cross case analysis will be conducted to determine the similarities and differences between cases.

CHAPTER 4

ANALYSIS AND FINDINGS

This multi-site case study explored how a principal leads, supports and influences the implementation of a one-to-one initiative. The study was designed to answer the following research questions:

1. How do principals lead teachers in the implementation of a one-to-one initiative?
    a. How do principals support teachers in the implementation of a one-to-one initiative?
    b. How do principals influence teachers' use of technology in the implementation of a one-to-one initiative?
2. How do teachers perceive the principal's efforts to lead, support, and influence the teaching staff in the implementation of a one-to-one initiative?

Chapter 4 includes the qualitative data findings and themes from both Naboo Intermediate School and Endor Intermediate School, presenting each school as singular cases. At the end of the chapter, findings from Naboo Intermediate School and Endor Intermediate School are combined to present cross-case findings through the lens of the study's research questions; that is, how a principal leads, supports and influences a one-to-one initiative and the teachers' perceptions of these efforts. Data were collected from principals, assistant principals, technology coordinators, a technology support teacher and teacher interviews, along with observations, documents and archival records to answer the research questions. The data sources collected allowed for triangulation of the study's findings and thus increased the reliability of the

overall study. For additional information regarding the methodology of the study or data collection procedures, see Chapter 3.

Naboo Intermediate School and Endor Intermediate School are located in the same district in the southeastern United States. Both schools consist of four grades: fourth, fifth, sixth and seventh grade. All grades are departmentalized, which means that teachers only teach one subject to multiple classes, with the exception of fourth grade teachers who teach two subjects during the day. Both schools have approximately 800 students and are fairly similar in student demographics. Specific district and school demographics can be found in Chapter 3.

Lake District

The Lake District currently consists of seven schools. The county's first school opened in 1797 and the county's schools slowly built from there. In 1913 Lake District High School was built and by 1918 had become the first four-year high school in the county. In 1953 the first modern elementary school of the district was built, which still stands today as a primary school. In 1968 the second existing primary school was built and it wasn't until 1995 that the third primary school was built. The district went in a new direction in 2000 and opened its first intermediate school, Endor Intermediate School. For the first 12 years it served only grades five and six, but with the addition of a new intermediate school in 2012, Naboo Intermediate School, Endor and Naboo both began to serve students in grades four, five, six and seven. In addition to the three primary schools and two intermediate schools, the district has one junior high school, Lake District Junior High, which has 908 students and educates the county's eighth and ninth grade students. The High School has an enrollment of 1,107 students.

Lake District has had a long history of academic success. Numerous schools in the district have been honored with the Rewards school designation, which began in 2012, a designation given to the top 5 percent of schools in the state for academic achievement and the top 5 percent for annual growth. The district has been nominated for the top Rewards school state award, which recognizes public schools and school districts that exemplify how to improve academic performance and rewards the winning district with $25,000. Concordia Elementary, Endor Intermediate School, Pantora Elementary, Yavin Elementary, Lake District Junior High, and Lake District High have all earned the Rewards school designation for either academic achievement or academic growth. Yavin Elementary has earned the reward twice, while Concordia Elementary was honored with a Rewards school designation for three years in a row. The previous US Secretary of Education, Arne Duncan, named one of Lake District's primary schools, Concordia Elementary School, one of only 337 National Blue Ribbon Schools in the country. Only schools with the highest academic achievement are given the National Blue Ribbon School award and Concordia Primary school was the second in Lake District's history to earn this prestigious accolade. Recently the Niche website ("K-12 School Rankings and Reviews - Niche," n.d.) released rankings of more than 120,000 schools across the nation and gave the Lake District an A rating and a first place district ranking for their state.

Overall the district has worked diligently to prepare their staff and schools for the implementation of the one-to-one initiative, through the implementation of an Early Adopter program, building a sound wireless infrastructure in each school, increasing Internet accessibility across the city, providing staff members with quality district led professional development and introducing principals to various technology integration models.

The Early Adopter program was a crucial piece of the district preparation of the initiative that benefitted and supported all parties involved in the initiative. The Early Adopters were a group of teachers who received one-to-one devices in their classrooms one year before the initiative was implemented throughout the district, a year before I studied the initiative. Every school in the Lake District selected twelve to fifteen Early Adopters who were each given a class set of laptops to incorporate in their classroom. Teachers, principals and the overall district learned from the Early Adopters experiences. Overall, the Early Adopter program was a critical program that the district adopted and the program was frequently cited by study respondents as one of the most successful pieces of the initiative. The technology coordinator from Endor Intermediate School summed up the impact of the program with these words, "I think we know now that having those Early Adopters was critical. To have those 14 people live that for a year, I think that is why we had such a smooth transition for the other teachers."

The district worked to ensure that students had reliable wireless Internet accessibility at school and at home before the one-to-one initiative began. The district installed additional equipment to ensure that teachers and students had the reliable Internet access that they needed. The district allowed students to take their computers home throughout the initiative and this decision meant that the district had to ensure that all students had access to Internet connectivity at home so they could use their devices outside of school. Even though the vast majority of families in the district had Internet access at home, there were still some lower income families in the district who did not have Internet access. To support the families who didn't have Internet access, the district provided five Internet mobile hotspots at each school that students could check out to take home. Moreover, the district also setup various church and business Internet

hotspots around the community. The church and business hotspots were areas that students could visit to access the Internet outside of school. The district's commitment to ensuring Internet accessibility at home and outside of school helped support teachers and principals in their implementation of the one-to-one initiative.

The district went to great lengths to support staff through professional development focused on technology integration before the initiative ever began. The district had a mandatory day of one-to-one initiative training in the summer before the initiative began to help prepare staff members for the first semester of the initiative. The summer professional development sessions were led by the Early Adopters who were able to share expertise they learned from their first year of using one-to-one devices in the classroom. Throughout my research, participants cited the importance of these district-created professional sessions.

All of the Lake District school principals were introduced to the Technology, Pedagogy, and Content Knowledge (TPaCK) and the Substitution, Augmentation, Modification and Redefinition (SAMR) technology models in a district-level meeting in preparation for the district's implementation of the one-to-one initiative. These models are important to discuss because participants in this study mentioned both models frequently and the models seemed to influence the leadership efforts of the Naboo and Endor principals. The TPaCK and SAMR models are two different research-based models to help educators think about technology integration in the classroom. The TPaCK model (Koehler & Mishra, 2009) "described how teachers' understanding of educational technologies and PCK interact with one another to produce effective teaching with technology" (p. 62). Koehler and Mishra believed "At the heart of good teaching with technology are three core components: content, pedagogy, and technology,

plus the relationships among and between them" (p. 62). The model aims to help teachers frame lessons around the three main components of teaching: technology, pedagogy and content knowledge. The principals were also introduced to the SAMR model (Puentedura, 2006), which details technology integration through four levels. The four levels are substitution, augmentation, modification and redefinition with the goal of moving to the modification and redefinition levels. As a teacher's technology integration moves from substitution to redefinition, the technology integration of the lesson shifts from enhancement to transformation.

In preparation for the initiative, the district created an Early Adopter program, established a reliable wireless infrastructure in each school, established ways for students to access the Internet outside of school, provided teachers with high quality professional development and introduced principals to the TPaCK and SAMR models. The district's preparation and support efforts before the initiative helped aid principals as they implemented one-to-one initiatives at their schools.

Case 1: Naboo Intermediate School

Walking into the entrance of Naboo Intermediate School the office is immediately to the right and the large glass windows that allow visitors to peer into the library are on the left. At the threshold of the building, the ceilings are high which gives the building an open and welcoming feel. In the morning Harry Belafonte's song, "Jump in the Line" plays in the background and administrators and counselors are at the entrance singing, dancing and greeting students as they make their way to class. These initial distinguishing features cause Naboo Intermediate School to immediately stand out from other more traditional schools.

Naboo Intermediate School is a school of 786 students that opened in 2012. The school focuses its efforts toward traditionally older students and lower middle school grades, serving students in the fourth, fifth, sixth and seventh grades. The school is a fairly affluent, predominantly white school and in the words of Principal Organa, "is not unbelievably diverse." The school is 87.5% white, 6.2% black or African American, 4.5% Hispanic or Latino, 1.7% Asian and 0.1% Native American, Alaskan or other (see Table 1). The school has 1.6% English language learners and 14.2% students with disabilities. The school consists of 21.1% economically disadvantaged students, which is about 1.7 percentage points higher than the district and 2.9 percentage points higher than Endor Intermediate School. When Naboo Intermediate School opened, the district had to reorganize zoning lines and one study participant from Naboo felt that this impacted the economically disadvantaged demographics of the school:

> When our school opened our free and reduced lunch rate was a lot higher and it is starting to even out more now. In the first few years if you were already in Endor Intermediate School, you had the option of requesting to stay in that school. So a lot of the affluent kids did stay there because the parents were more comfortable with that school.

Even though some participants in the study felt that Naboo Intermediate School is on the "less affluent side of town and we have more free and reduced lunch qualifying students here than across town", the school still has a significantly lower number of economically disadvantaged students compared to the state average of 35.1%.

Naboo Intermediate School has a unique structure compared to most traditional schools. Each student and teacher is assigned to a team or a "house" and the school has two houses per grade level for a total of eight houses in the school. The houses each have a color and the

students in the house at the beginning of the year name their house together. The school also assigns encore teachers (art, music, physical education, etc.), special education teachers and administrators to a house to assist with collaboration and teamwork. The school has two floors, with the fourth and fifth grade houses on the bottom floor and the sixth and seventh grade houses on the second floor. When assigning students for each house, the administration tries to ensure that houses have a diverse group of learning abilities, cultural groups and genders. Moreover, learning styles, learning abilities, student test scores, teacher recommendations, gender, and the student's previous school are taken into account when choosing students for houses. The school is departmentalized, that is, teachers in fifth, sixth and seventh grade teach only one subject and students change classes for each subject like in a typical middle school. The Naboo teachers in fourth grade teach two different subjects to their students, which means they still teach fewer subjects than in traditional elementary schools where teachers often teach all four main subjects to their students. Within each house, students are ability grouped and go to each class with students who have similar learning abilities.

The philosophy of Naboo Intermediate School is outlined on their website and details the following:

> The philosophy of Naboo Intermediate School is that each student is a valuable member of the team. A great deal of planning goes into providing experiences and interventions that promote a sense of belonging, thus avoiding many behavior problems. Students and staff will follow the Naboo Way and show a commitment to value the learning community, its individual members, one's self, and the learning experience. The Naboo Way: S-Show Up-Come prepared, stay focused, participate, and have a good attitude. I

> will show up in life ready to take on the day's successes and challenges. I choose to be present physically and mentally in everything I do. O-Own It-Make good choices, be responsible for my actions and attitude, and let go and move on. I am in charge of what I think, say and do. I am responsible for me! A-Achieve- Do my personal best, use perseverance, set high expectations, and be part of something bigger than myself. I set high academic and personal goals and work to, not only accomplish, but also exceed them. I will do my personal best in all aspects of life. R-Respect- Be safe, do the right thing, treat people right. I treat everyone and everything with integrity. I show respect for my school, fellow students, teachers, family, community, and myself.

Throughout the Naboo Intermediate School building, the motto "The Naboo Way" and the letters SOAR are displayed. The school website explains, "In essence, our desire is that all our stakeholders 'show up', 'own it', and show 'respect' for one another by working in partnership so all students can "achieve" and SOAR to New Heights." The principal explains the approach of the school on her page of the website:

> It is my honor to work with caring and dedicated professionals to grow a school culture that is student centered and learning focused. It is our collective goal to work with our staff, parents and community to ensure that every student at Naboo will SOAR the "Naboo Way"! We have confidence that you will: Show up, Own it, Achieve, Respect.

The "Naboo Way" and SOAR mottos have been in existence since the opening of the school in 2012 and the mottos are shared on the announcements every day and are found on most Naboo Intermediate School shirts or signs in the building. SOAR is embedded in all that the school does and appears to have become more than just a school motto.

School Supports

Naboo Intermediate School had various structures in place to help support teachers and students in the school and throughout the initiative. The supports in place were various school meetings and groups, technology help supports and school based professional development.

Naboo Intermediate School held staff meetings, leadership team meetings, Teacher Peer Excellence Group meetings and Professional Learning Communities that sometimes addressed technology topics throughout the initiative. Staff meetings were held monthly and focused on different school topics, but often included a portion of the meeting that centered on technology related items. Leadership team meetings were also held monthly and members included teachers from different subjects and grade levels and two student representatives. Throughout the semester the leadership team made decisions on multiple pertinent school topics and sometimes discussed technology related matters. Naboo also started Teacher Peer Excellence Group (TPEG) meetings during the semester I studied the initiative. The TPEG meetings were voluntary meetings that occurred weekly and gave five to six teachers an opportunity to plan a lesson collaboratively, observe a teacher in the group teaching the lesson, and then meet together as a team at a later time to provide feedback on the lesson. The group members often discussed the use of various technology programs to help enhance the lesson and the meetings were "designed to support educators to build a professional knowledgebase in teaching" ("TPEG - Tennessee | Shanghai - Leadership Collaborative," n.d.). Naboo also held monthly Professional Learning Communities (PLCs) where all teachers from the same subject and various grade levels met after school. Professional Learning Communities are defined as "educators committed to working together collaboratively in ongoing processes of collective inquiry and action research to achieve

better results for the students they serve" (Dufour, DuFour, Eaker, & Many, 2006). The PLCs often discussed technology topics and in the various PLCs I observed teachers talked about technology resources, deliberated about what technology resources they needed the most, and shared how they were using their one-to one devices in their classrooms.

Naboo Intermediate School had various technology help supports that were put in place for the implementation of the one-to-one initiative. These structures had the sole purpose of supporting teachers and student use of technology throughout the initiative. Some of the main technology supports put in place were the technology Help Desk, the school technology support teacher, the full time technology support teaching assistant, the technology specialist and the Naboo one-to-one initiative student squad. The Help Desk was a room in the school building that was staffed with an almost full time technology support teacher and a full time technology support teaching assistant. The technology support teacher helped support teachers and students with any computer problems they had and sometimes provided technology focused professional development for the school. The full-time technology support teaching assistant centered most of her efforts on supporting the teachers and students with any troubleshooting problems they had and spent the majority of her time supporting the fourth grade with any iPad problems that arose. Naboo also had a full-time fourth grade teacher technology specialist who helped if teachers had trouble with technology, specifically iPads. In addition, the technology support teacher managed a one-to-one initiative squad, a group of students who were put in place to help support teachers and other students with technology problems.

Naboo offered professional development sessions at various times throughout the first semester to best meet the needs of teachers. Professional Development topics were based on

relevant topics, administrator walkthroughs, Help Desk issues, administrator input, and sometimes teacher surveys. Most school level professional development sessions usually had a technology focus and teachers were given a choice of which session to attend. I attended a school based professional development day at Naboo Intermediate School and on that day the principal, two assistant principals and the technology support teacher each presented sessions. The professional development sessions were targeted to different technology proficiency levels and were on the subjects of Office Mix, OneNote, and "Capturing Kid's Hearts". The school based professional development was another school support that helped in Naboo Intermediate School's implementation of the initiative.

Naboo Intermediate School

The full time administrators at Naboo Intermediate School were interviewed three times during the study. These participants included Principal Organa, Assistant Principal Kanata and Assistant Principal Carlissian. Assistant Principal Kunb was interviewed two times during the study because she was a part time assistant principal and a part time teacher. All of the participants have different backgrounds. Therefore, an overview of the administrator background follows to better understand how this influenced their leadership and implementation of the one-to-one initiative.

Background of the Principal and Assistant Principals

Principal Organa is the head principal of Naboo Intermediate School and graduated high school from a small rural school in Tennessee with a senior class of less than fifty students. Even though she originally thought she wanted to go into education, she went in a different direction and majored in computer science in college. Upon graduating college, Organa worked

as an assistant buyer and store manager at a department store before she decided to go back to school to obtain a degree in secondary science education.

Principal Organa received her first teaching position at the same rural school she attended, teaching high school and middle school reading and language arts. During this time, she wrote and was awarded a 21st century grant for 8 computers and a teacher station. After three years as an assistant principal, she was offered a job as an assistant principal of curriculum and instruction in a K-8 school, and was promoted to head principal two years later. She then held an instructional supervisor position for five years and became more proficient in instructional technology through her connections to the district instructional coordinator at the time, Miss Netal. In her role as instructional supervisor, she taught many professional development sessions with Miss Netal on teaching and learning and using the tools to integrate technology into teaching. Organa ultimately applied for a position in the Lake District and was offered an elementary principal position. Due to the downturn in the economy, the elementary school was eventually closed. However, this gave Principal Organa the opportunity to accept the Naboo Intermediate School principal position, where she has been principal since 2012. The one-to-one initiative was implemented at the school during the 2015-2016 school year. Principal Organa has earned her doctorate in Educational Leadership and Policy Analysis and has also taught master's level education classes at two universities.

Assistant Principal Carlissian began his career as a high school math teacher. He taught students in grades nine through twelve, then took a position with the Lake District at the middle school where he taught eighth grade for three years. During this time, assistant principal Carlissian completed a specialist in education (Ed.S.) degree and gained an administrative

license. Principal Organa hired him as an assistant principal the year Naboo Intermediate School opened. Carlissian regularly used instructional technology in the classroom when he was a teacher and even encouraged students to bring their own devices to school to use in his class. Assistant Principal Carlissian is the testing coordinator, TPaCK coach for math and social studies and serves the fifth and sixth grade students and teachers. A TPaCK coach works with teachers to help them effectively integrate technology, pedagogy and content knowledge.

Assistant Principal Kanata's career began as a fourth grade teacher in the Lake District. She taught fourth grade for eight years before becoming a part time fourth grade teacher and a part time technology coordinator. After she split time as a technology coordinator and teacher for a year, she became a full time technology coordinator and remained in this position for 12 years. Assistant Principal Kanata was hired as an assistant principal by Principal Organa in 2012 when the school opened. When Kanata first began as an assistant principal, her role was similar to that of a traditional assistant principal. Because of the impending implementation of the one-to-one initiative and because of the departure of the school's technology coordinator, Principal Organa asked Assistant Principal Kanata to not only be an assistant principal, but to take on parts of the technology coordinator position. Specifically, she oversees the software licensing and is over the technology support teacher and the technology support teaching assistant. Assistant Principal Kanata is also the technology, pedagogy and content knowledge (TPaCK) coach for reading and language arts and serves teachers and students in grades four and seven.

Assistant principal Kunb is a second career educator. She began her career as a marine and aviation insurance agent, but later decided to go back to college to become a teacher. She has taught for 18 years and taught kindergarten, second grade, three-four-five multi-age, three-

four multi-age and she has now been a sixth grade science teacher for three years. This has been her first year as an administrator and her position arose out of Principal Organa reorganizing positions. Assistant principal Kunb teaches half the day and is an assistant principal for the other half of the day. Her job focuses mostly on being the disciplinarian so that the other assistant principals can focus more of their time on their other duties like TPaCK coach, technology coordinator and testing coordinator. She also is the curriculum coach for science and helps evaluate teachers. Principal Organa regularly rotates different people into this part time administrative role every year or two in order to build various teachers' leadership capacity. Principal Organa mentioned that she may rotate a different teacher into this role next year.

Analysis of Research Question One A and B

This section examines the data through the lens of the first research question:

1. How do principals lead teachers in the implementation of a one-to-one initiative?
    a. How do principals support teachers in the implementation of a one-to-one initiative?
    b. How do principals influence teachers' use of technology in the implementation of a one-to-one initiative?

Throughout the interviews participants had a difficult time separating the idea of leading, influencing and supporting the initiative. More often than not, participants would group these three ideas together when they were reflecting on the leadership of the one-to-one initiative. Participants commented on how certain actions their principal took would not fall into the idea of lead, influence or support, but fell into all three categories. Principal Organa shared her thoughts on the idea of lead, influence and support in her third interview at the end of the semester,

"Leading, supporting and influencing it? So a lot of it is just your daily walk. What you do and who you are and all your interactions, so support or lead or influence are almost synonymous terms for me." For these reasons, question one and the subparts were analyzed together. When reporting the findings, I will detail whether a response was limited to the lead, influence or support categories or whether the terms were grouped.

This section includes analysis of qualitative data collected from interviews, observations, principal shadowing, documents and archival records. Interviews from the principal and three assistant principals were analyzed for a total of 11 interviews. During the interviews the participants were asked a variety of questions, but notably were asked to share what their principal had done to lead, influence and support teachers during the implementation of the one-to-one initiative. Once the participants had answered this question, they were given the list of the twelve a priori themes, which were derived from a literature review I conducted on principal leadership of instructional technology (see chapter 2 "Roles of Principal Leaders of Instructional Technology" section for more information) The interview participants were asked to share which of the twelve roles from the list described how their principal had led the initiative. Participants were asked to provide details or an example of how their principal led in the roles that the participant had selected. The list of twelve a priori roles was utilized to garner more specific information from the interview participants about how the principal led, influenced and supported teachers in the implementation of the one-to-one initiative. Observations were conducted in staff meetings, leadership meetings, PLCs, professional development sessions and classrooms. The observation protocol detailed the twelve a priori themes as "Leadership Look

Fors" and the themes helped frame the observation notes that were documented. Emails, the staff handbook, the staff OneNote notebook were also analyzed for themes.

All qualitative data were analyzed and codes were created. The data sources were coded through the lens of the first research question, how does a principal lead, support and influence a one-to-one initiative. The codes were assigned to the following twelve a priori themes that were identified in the literature review: visionary, digital expert, manager of resources, model of technology use, technology supporter, leader or organizational, structural and policy change, leader of change in pedagogy and learning, leader of cultural change, evaluator of technology, encourager and supporter, family and community engager and leader of ethics in technology. The theme of HR Harriet was not initially included in the a priori themes, but was added upon reviewing and coding the qualitative data. The rankings of Principal Organa's and the assistant principals' perceptions of the roles Principal Organa took on while leading, influencing and supporting the one-to-one initiative can be found in Table 4. The rankings are based on the coding totals for each role during the data analysis. Teacher interviews examining perceptions of the principal's efforts to lead, support and influence the teaching staff in the implementation of a one-to-one initiative will be discussed in the section documenting the findings of research question two.

Visionary

A principal's shared vision can influence the outcomes of a one-to-one initiative (Peck et al., 2008). The topic of vision arose repeatedly in regard to Principal Organa's efforts. In fact numerous participants thought that a visionary was one of the roles Organa embodied the most. When coding the data, the role of visionary was coded more than any other role for

Table 4

Rankings of the Administrators' Perceptions of Principal Organa's Roles

Role Ranking	**Principal Organa**
#1	Visionary
#2	Model of Technology Use
#3	Leader of Change in Pedagogy & Learning
#4	Encourager and Supporter
#5	Leader of Organizational, Structural & Policy Change
#6	Leader of Cultural Change
#7	Digital Expert
#8	HR Harriet
#9	Manager of Resources
#10	Technology Supporter
#11	Evaluator of Technology
#12	Family and Community Engager
#13	Leader of Ethics in Technology

Note. Rankings are based on coding frequency totals for each role during data analysis.

Principal Organa. Both Assistant Principal Kanata and Assistant Principal Carlissian agreed that Organa most embodied the role of visionary, with Carlissian noting that "it's just who she is. She lives and breathes that." Throughout the data collection at Naboo Intermediate School, Principal Organa consistently spoke of her vision of the school, whether in parent meetings or leadership team meetings. When I asked Principal Organa to share what roles were most important in her leadership implementing the one-to-one initiative, she responded by saying the visionary role. "I guess I go back really to the visionary, and that modeling piece is more of what I have done and I guess the visionary around getting people in the right seats," said Principal Organa. Organa saw herself in this role and, throughout the study, it was clear that her staff saw her in this role as well.

Many participants in the study reflected the overall importance of this role. Through various comments, participants articulated that leadership begins with a principal's vision. Principal Organa reflected on the importance of the vision coming from the principal:

> We (principals) are the face and the message. I can delegate it, but it kind of comes off typically that if you delegate too much then they begin to question and ask what does she think? If they're constantly hearing the message from other people, even if it is a positive message that is happening at our other schools, they still think what does the principal think?

Assistant principal Kunb, who was still a classroom teacher, focused specifically on how all leadership starts with being a visionary:

> I think it's really important that you have somebody that is pointing you in the direction that you want to go. And then everybody else can grab an oar when you start paddling. I think she has been really good because it's easy to get sidetracked when you are doing this. You can go off chasing a chicken and you don't want to do that, so she's really good about saying, Nope, come back. Here is where we are going. Just keeping us focused and I think that's critical.

Principal Organa summarized the idea of vision and its importance in a powerful statement:

> Figure out what your number one goal is in this and always go back to that. It's just like I said, just go back to really what are you trying to do here and that's kind of your litmus test. 'Does this matter in this moment?' Is that a huge piece of this or is that just a little minor piece right now?

All of the assistant principals spoke of how Organa's role as visionary has kept them on track. Assistant Principal Carlissian shared how this made his job easier:

> Principal Organa has a clear strong vision and she knows where she wants it to go and she can communicate that clearly. So it makes it easier for Assistant Principal Kanata and I to be like okay, this is the vision, let's go out there and start to make it happen.

Having a principal who is a visionary benefits everyone in a school and helps them move forward towards the goal of implementing their one-to-one initiative.

While the staff saw Principal Organa as a visionary and highlighted the importance of this, it was more difficult to identify in words exactly what that vision was. Through reviewing various interviews, meeting notes and documents, the principal's concrete vision showed itself in various ways. One of the biggest visionary pieces that was prevalent during the study was the principal's use of the school motto, S.O.A.R., which stands for show up, own it, achieve and respect. Whether the motto was on the website, staff shirts, walls in the hallway, or on a PLC meeting agenda, the phrase was everywhere in the school. Although the motto SOAR didn't mention technology or the one-to-one initiative specifically, it was the overall school vision that permeated the school and was the message from which all technology visions stemmed. Since the message of SOAR did not specifically touch on instructional technology or the implementation of the one-to-one initiative, I asked interview participants the follow up question of whether or not their schools overall vision and goals had changed since they began implementing the one-to-one initiative. Most felt that the overall vision and goals of the school had remained the same. Assistant Principal Kunb answered, "No, I think our vision and school goals have stayed the same. It's ultimately moving these kids forward." Assistant Principal

Carlissian made the observation that the school's vision and goals didn't change because of technology, but the addition of one-to-one technology helped "become a way to solve the school's goals." The only place where technology could be found in the school's vision, mission or goals was on the portion of the school website where it detailed the school's legacy. The legacy portion described Naboo Intermediate School's legacy as, "Leadership, Excellence, Generosity, Academics, Character and Opportunity." Under the heading "Opportunity" it shared that, "All students will seize the opportunity to learn technological skills for the 21st Century, explore career choices, build practical life skills, and participate." In an interview Principal Organa condensed the school's vision and goals for the school into two points and shared how they related to technology:

> I very much just still just view it as something very simple and maybe almost too simplistic, but it helps me to be a sane person. It's all about two things. That our kids are learning at a level they can be successful against the standards and then being good people. So really that hasn't changed, that's a constant. Now the standard or the expectation of what that looks like maybe changes or how they learned, or any changes or technology, but still your end goal is still the same. We want great kids, good people and we want to do everything we can do to teach them to become good people, that's what we talked about in the leadership team meeting today.

Principal Organa made it clear that with a focused school vision and strong school culture, "It's easy to add technology because it's a part and it's just another tool."

While the overall school vision did not go into the specifics of how technology played a part of that vision, study participants felt that the principal and the administrative team

consistently shared a clear technology vision. That message was that it is not about the technology and that technology must be used with purpose. Principal Organa shared how being the visionary was one of her main roles:

> I think this visionary role is probably the main one because I get a lot of questions about that. People ask what's your vision for that and I always have to go back to it it's not about the technology, and the TPaCK model helps because it helps us talk about content in those three areas there. I think that is my primary role.

The TPaCK model (Mishra & Koehler, 2006) is an instructional technology model that Lake District principals were introduced to in a principals' meeting before the initiative began. In all the various forms of data I analyzed and collected, Principal Organa never sent a message that technology is to be used as much as possible. Organa's message and vision that was communicated throughout the initiative was that technology should not be used just to be used, but it should be used with a purpose. Principal Organa stated in an interview, "it is not all just about technology use, it's about how it's used." Her administrative team frequently added to this point throughout the study. Assistant Principal Kanata shared:

> She is definitely the visionary and she keeps us on track with it. Just overall, but also with instructional technology. She very much makes it evident that it all has to work and that is the baseline. From there it's all about how you use it with students and how it makes us better instructors and better students. 'That's the important work' is her phrase.

Assistant Principal Carlissian touched on this idea of technology use with a purpose:

> I was like, telling them, just because they have it doesn't mean they have to be used every single lesson. It needs to be purposeful, it needs to help the lesson and it needs to meet all

> your goals. If you can do without it, that's okay too. You don't need to have them operating on the computers twenty-four seven.

Principal Organa regularly shared this message and vision and Assistant Principal Kunb expressed the importance of this:

> Making sure that the staff does understand the purpose, the goal and the vision. Especially for teachers, teachers have to know how is this going to help my students. We don't really need another gadget really, we need to hear that this is really going to make a difference for my students.

At the end of the semester Assistant Principal Kanata reflected on this vision and the reality of Naboo's classrooms one semester into the initiative:

> Every classroom you go in, if they're using the technology, they're using it well. No one is just using it for the sake of using it. No one is using the laptops just to say that the laptops are out today.

Through the majority of my classroom observations it appeared that Principal Organa's vision of using technology with a purpose was slowly becoming a reality.

Digital Expert

Flanagan and Jacobsen (2003) found that if school leaders are not prepared as digital experts, they may struggle to achieve their desired outcomes in their schools. Dexter (2007) studied a one-to-one middle school and even detailed that "if principals wish to advance an initiative like technology integration in classrooms, they may need to develop expertise and not just hire it so they can leverage their authority" (p. 20). Throughout the study, whether or not Principal Organa took on the role of digital expert was dependent on one's definition of the role.

Participants had a difficult time defining the role of digital expert, but most concluded that Principal Organa was very knowledgeable in the realm of technology. However, most were reluctant to call her a full-blown digital expert. Assistant Principal Kunb explained, "She is very good with technology, but I would not consider her a digital expert. Digital expert, that's a very high standard in my world because I go from teachers to the tech people." In one interview Principal Organa preferred the phrase, "digital wannabe":

> I have always said I'm not a digital expert, I'm a wannabe techie. That's what I am, so I surround myself with people, like when I go to summer one-to-one initiative training and I find people and I get into that and I'm good at doing the YouTube's and being a self-directed learner. I'm a digital wannabe, but I very much use it in my organization.

Regardless of how participants in the study described Principal Organa's digital expertise, she became a digital expert in the areas in which she needed to become an expert: "I use the tools that I use for my job, those are the ones I get really proficient with." Principal Organa had enough digital expertise to be involved with most decisions regarding the one-to-one initiative as Assistant Principal Kunb explained, "I think she is high-tech enough herself, and she believes in the initiative enough herself that really every decision that's made throughout the process, she's involved in some way."

When Organa took on the role of digital expert during the initiative she had a propensity to be an innovator or want to try new things. There were a few examples of this over the course of the semester I spent at Naboo. One time when we were waiting for a meeting to begin, Organa shared with me a product called a Myo armband. The Myo armband was an electronic armband that allowed her to use her arm movements to control her PowerPoint presentation.

Organa could move the slides forward with a swipe of an arm or make a fist to zoom in while she was presenting. Organa had purchased the product on her own because the product was new and interested her. When we were waiting for the parent organization meeting to begin, Organa showed me a startup product online that was called a Qball. The Qball was a soft dodgeball like ball that had a microphone in it. The ball could be passed around the classroom and students could speak into the ball so that their voice carried over the speaker system to the rest of the class. Organa told me that she had invested money in the product to be one of the first one hundred to receive it. Principal Organa shared her innovative or risk taking side when it comes to technology:

> Yeah, I have a tendency to be a little bit of a risk taker. I'm okay if I spend $150 on something and it doesn't work for me. It's $150 and I'll find some use for it somewhere. Not so much $1000, but to me I very much view it as, let me try that and would that be something we could utilize because kids would get into that if they could learn to present, you know because they like to present it and they like wearable technologies and that kind of thing.

Assistant Principal Carlissian touched on this ability to interject new things as a digital expert:

> She becomes an expert and finds and tries to incorporate something new with different meetings. Like with PLCs or staff meetings, it's always can it be based in the technologies that we have. Or something new and cool that she wants to share, that she also is keenly aware of who in the building is excelling using types of technology, so it's not always her modeling.

Principal Organa's tendency to try new technology with and around her staff did not go unnoticed by those around her.

Even if Principal Organa was a self-appointed "digital wannabe," she knew the importance of having digital experts around her. Assistant Principal Kunb explained, "She may not be the digital expert, but she's…. got somebody who is." Principal Organa heavily relied on other digital experts during her leadership of the one-to-one initiative. Organa hired two assistant principals that were technologically savvy digital experts and she put various other digital experts around her. When Principal Organa was asked about taking on the role of digital expert during the initiative, she responded with, "That's not a role of mine and I've got everybody in the building that is proficient at that and they're all side-by-side to do that so I've got plenty of resources."

Even though participants at Naboo Intermediate School didn't believe Principal Organa had to be a digital expert, they appreciated her overall technological knowledge and courage to take technological risks during the initiative. Principal Organa reflected on the idea of a principal needing to be a digital expert:

> I don't think a principal has to be a technology expert, but they have to have buy-in and live it. And even if they don't know all the details of how to use it, they have to believe in it and be behind it. Because you're going to have teachers at all different points of acceptance. I think as a principal, once the decision is made, if you are not all in, then you need to get out. I really do feel that way. Now, they don't have to be the digital expert and they can leverage other people, but they have to believe that it is a tool that can benefit

> their students and I have to be able to embody that to the staff, and to the community, and to the parents and to the kids.

Principal Organa may not have always been the digital expert that teachers looked to when they were interested in a new technology program, but it was clear that her knowledge of technology was important to her colleagues.

Manager of Resources

When speaking to participants about Principal Organa and her role of manager of resources, Organa along with other members of the administrative team spoke of how she managed the resources of technology hardware, software, outside the district professional development and personnel. The majority of the hardware purchasing was done by the Lake District for the one-to-one initiative, so Principal Organa really had little to do when it came to purchasing additional hardware or devices. Principal Organa did mention that the school purchased an iPad Mini for each teacher before the initiative began. Organa also worked hard to get the parent organization to fund a new sound system for the theater, but this management of resources really did not impact the one-to-one initiative.

As a manager of resources, software resources were the specific focus that was most referenced by Principal Organa and her administrative team. Principal Organa reflected on her role of manager of resources when teachers approached her about purchasing software:

> I think it's being available particularly around the materials and the resources. They feel like maybe they don't have something they need or feeling like it will be easier just to buy this or whatever. So just listening to that and then really reflecting back and giving them

a little time and saying we got some money we can spend, but is this really what you want here?

When approached about purchasing software during the initiative, Principal Organa was torn between purchasing new software to help support the teacher or encouraging the teacher to use the software they already have:

> I do think consistency is important as well. If you've got a tool, why go out and use another tool if you got a really good tool. So I wanted teachers to know still about the tools that we have. I don't want them frivolously spending that on other things.

Assistant Principal Carlissian addressed the importance of her playing the role of manager of resources and making those software-purchasing decisions:

> One way that she is able to support teachers in a way that my position cannot, is what she values in technology and what it does for students with purchases and talking to teachers about here's why we're not going to go that route or here's why we are going to go that route.

Ultimately, Principal Organa trusted her teachers more often than not and did everything she could to support their software needs:

> I need to make sure that the teachers have what they need and if there's a tech tool or something that solves issues for them I need to hear that and provide them what they need to make sure they have the resources they need because I've got people that have know-how.

The manager of software resources was a role that Organa increasingly had to play as the semester went on, but it still was not a predominant role like some of the other roles she played while leading the initiative.

Another area in which Principal Organa managed resources was with professional development. While the district and Naboo provided high quality professional development to help with the implementation of the initiative, Principal Organa decided to send a team of administrators and teachers from Naboo to the International Society of Technology in Education (ISTE) Conference in Philadelphia, Pennsylvania the summer before the initiative began. This was funded by the school, which used a large portion of the school resources, but it was an opportunity for the team to attend the preeminent international instructional technology conference and bring back ideas for the first year of the one-to-one implementation. Some of the things they learned were shared in professional development sessions throughout the first semester of the initiative. Principal Organa reflected on the conference in one of her interviews:

> That was a time for us to go to a conference and really understand the roles and bond as a team and just having that experience together. I needed them to trust us and see us from the inside and then what came from that was it helped build our capacity and we came back for this year more excited than we ever have been.

This was a different way of managing resources, but was impactful nonetheless.

Principal Organa referenced the role of reorganizing personnel funding so she could restructure her personnel roles to best utilize the strengths of her staff. Principal Organa did not rehire a full-time technology coordinator the year before the initiative began and instead split the

role between a teacher and an assistant principal and added a part time administrator. Principal Organa shared a little about this decision in an interview:

> Part of it was the funding and the positions I had. I took the technology coordinator position. There were two priorities; we had the one-to-one initiative going on and then also in our district one of our priorities was developing leadership within our building for future administrative roles.

While the decision to not rehire a technology coordinator is described more under the role of leader of organizational, structural and policy change, it still impacted Organa's role as manager of resources and made her have to think about how she would fund such a change to benefit the implementation of the one-to-one initiative.

Model of Technology Use

The role of model of technology use is one that epitomized Principal Organa during the implementation of this initiative. Assistant Principal Kanata thought that this was the role that Principal Organa took on the second most during the initiative. In the first interview this was the role that immediately came to Assistant Principal Carlissian's mind, "She models technology all the time, so anytime we do any kind of get together or anything like that she's going to use the technology that we have." The role of model of technology use has not been foreign to Principal Organa. When Organa first became a principal in the Lake District she used a Promethean ActivBoard for staff meetings.

When Principal Organa was asked why she modeled technology for staff she explained, "I think it's being a teacher at heart and missing that." Principal Organa never seemed to lose her inner teacher, which drove her modeling, "I think that's because you just miss teaching, therefore

you want to do it and then you find ways to hook them and you want your teachers to be motivated." When I asked if Organa found modeling as a way to hook teachers, she responded by saying:

> Yes, they see me and it makes them more interested. Like sometimes when you're doing it and something goes wrong. You're like if you were evaluating me right now what would I score on the rubric? And you make it focused on best practices. So I like that and it's just a way to fulfill that inner desire in me.

Organa and her administration regularly referenced their background in teaching and they each explained the parallels between modeling for teachers and modeling for students. Assistant Principal Kunb explained:

> Our administration team has been all in on this whole thing and trying to model that and utilize it. Which is what we teach our teachers to do for our kids. So as an administrator you have to do the same thing for your teachers.

Assistant Principal Carlissian agreed:

> I think that's us as a team. Really our hearts are as teachers and I think you do that with your students and in a way our staff is our students and so if we really expect them to do it, I think we have to model.

Principal Organa detailed that she will continue to see her staff as her students:

> I do think just like the kids look to the teacher in the classroom and teacher in the classroom models and sets the expectations for the kids, I very much view administration like they (staff) are my class and they are my learners and so I need to model that

expectation and Assistant Principal Carlissian and Assistant Principal Kanata need to model that expectation.

Principal Organa's leadership of the one-to-one initiative relied heavily on modeling instructional technology and far less on directives. There were some powerful examples during the initiative of how modeling can be more effective than directives. Organa shared that she liked to model different technology programs and said in her words, "here's why I love this" instead of telling teachers that they had to use this. Assistant Principal Kunb, a part time assistant principal and a part time teacher, discussed in her interview Principal Organa's modeling instead of giving directives:

> I've seen a lot of principals and assistant principals go the directive route and I don't find that very successful. But I do think the modeling approach is very effective and she does that very well. She puts it out there. She does it and just lets it simmer and we're fortunate that we have a team that will grab that and run with it and beyond.

Kunb's description of "letting it simmer" was a good description of Organa's little to no pressure style of leading and taking on the role of model of technology use during the initiative.

When discussing the initiative and the role of model of technology use, it is difficult to describe Organa's modeling alone because the administrative team had such a team approach to this role. All administrative team members had a hard time separating Organa's technology modeling from the team's modeling. When I spoke with the administrative team in interviews about the role of model of technology use they frequently used words like "we" and "us." Assistant principal Kanata commented, "I think we all model technology. That's a big one for all

of us." Principal Organa shared, "That's one thing we all decided to do was we were going to model it."

When I asked Principal Organa where the idea of modeling throughout the initiative came from, she explained:

> I really think that came out of the ISTE conference because then I began to really think about how I can leverage those strengths. Assistant Principal Kanata was working on those things and all of that and as we came back to plan our professional development, that's when we went, hey we need to model these things. So let's go look every day and look at the tools we use.

It was very clear throughout the initiative that the administration was a lot more intentional and purposeful about modeling various technologies that they wanted their staff to utilize during the initiative than in previous years. Organa described the difference between the administrative team's modeling during the year of the study compared to previous years:

> We have always used technology as administrators and from the onset we used our calendars and electric calendars, but I really felt like we hit the ground running this year. We were a lot more purposeful about what products we were modeling and utilizing as an administrative team

The decision to purposefully model technology was a powerful team decision that they made in order to encourage their staff to use various technologies. Assistant Principal Kanata reflected on the team's decision to purposefully model technology during the initiative:

> Well, I think it's huge. We have purposely and painfully tried to be role models for how to use technology. We expect our teachers to use it with our students and we use it with

> our staff. I think we are a pretty tech savvy group of administrators, so we purposely make sure we use those tools so the teachers will turn around and use them. Is that 100% necessary? Maybe not, but I can't imagine you getting….You know, got to walk the talk, you can't just talk it. I think it's very important we do it that way. It's important that we do what we expect them to do with our kids.

This decision to purposefully take on the role of model of technology use during the initiative seemed to have a powerful impact on the way that technology was used during the initiative.

Principal Organa and her administrative team provided some powerful examples of modeling throughout my study of the initiative. I was able to visibly witness her take on the role of model of technology use in a staff meeting, professional development session, and leadership team meeting. The most powerful example that I heard repeatedly during the initiative was the OneNote modeling example. As I conducted my classroom observations about midway through the semester and at the end of the semester, I noticed that almost every classroom I visited was utilizing a program called OneNote with their students. OneNote is a software program created by Microsoft, which is a digital notebook that visually looks similar to a traditional notebook. Digital tabs in different colors help organize the digital notebook and users can upload various forms of files and multimedia to the electronic notebook pages like Word documents, PDFs, images, voice recordings etc. In my visits I clearly saw the phenomena of OneNote had swept the school and it was prevalent almost everywhere. When I asked Principal Organa and the administration about the OneNote craze and whether that was an expectation put forth by the administration, all four administrators said it was not. The wide use of the OneNote program

begged the question of how the particular software could have been adopted by the majority of the staff in only three brief months since the one-to-one initiative began.

The program OneNote was first introduced to Assistant Principal Kanata and Principal Organa at a conference that they attended a year prior to the start of the one-to-one initiative. Even though the district went to great lengths to secure wireless Internet hotspots around the county for students to utilize, Organa and Kanata were still concerned about students who would not have access to the Internet at home and how they would complete their schoolwork. They looked for a program that fulfilled certain needs and allowed students to access their work offline as well as online. When Assistant Principal Kanata and Principal Organa were first exposed to the OneNote program, the program immediately appealed to the administrative team because it solved the problems they were facing. Assistant Principal Kanata went on to explain what made the program so unique and appealing:

> It's automatic. If you work on it here you got everything. You close your laptop and you go home and then you open it at home and you still have it. It automatically syncs. There's no doing, it's incredible! So we decided that we are all on that bandwagon.

It was the discovery of this program and the excitement around the potential problems it could solve that led the administration to model the OneNote program for staff.

While the program had some excellent features to offer, the combination of OneNote's features and the power of modeling made OneNote visible across the school. Principal Organa described the modeling of OneNote at the beginning of the year in her own words:

> One Note is a perfect example to help solve some of our problems and use it as a collaboration tool. So we offered it on a Tuesday and it was our first day back. So I

> modeled that and I talked about here's where you go to cut down on your email and it's always here for you to access and we kept all of our in-service notes in it and we just utilized it. By the end of the day on Wednesday we had a group of teachers that said we need more training. So I said you want training as an end-user? They said no, we want training on how to use it in our classrooms. Our plan was to use it as a staff tool this year. I expected to use it as a staff tool and thought a few teachers would jump on it that are out front and then we'll work for the following year of really talking and setting up the teacher class notebooks and all that. By Friday we had all the class notebooks set up because the teachers wanted it. It was because they saw how it might solve some problems with them in the classroom.

Principal Organa explained that they scheduled an optional OneNote training for the Friday before the first day of school to meet the new demands of the staff:

> Friday we set out to have an optional OneNote session and we said here's how long it will be and here's what we'll do. We said it will take about 45 minutes and the whole purpose is to get you and your class started with OneNote. If you don't want to come that's okay, but you can just come and see. So they were just eating it up. We probably had everybody (all teachers) except for a few Encore people come. Now the Encore teachers are on board because they can put their audio into OneNote. We offered two sessions and they were both packed.

Despite the early interest in OneNote, Principal Organa and the administration were adamant that they didn't set any formal expectations for using OneNote during the first year of the one-to-one initiative. Principal Organa described, “What our plan was, we’re going to use it as a staff this

year and we're going to be end-users and then the goal would be see where it goes and we'll let them be end-users." Assistant Principal Kanata agreed, "The expectation was to use it however you want to. It was here it is and here's how you build a classroom notebook and here are some notebooks and what you could do with it, and then it just took off."

When I pressed into the OneNote phenomena and why the administration thought it caught on so quickly, Assistant Principal Kanata detailed, "It just came at the right time and it was the right answer to what we needed and we could manage it in a way that was just, the kids could do it, we all could use it." Principal Organa felt, "It's solved some of the problems that they had with Blackboard because they didn't have it the previous years. They knew, they were trying to figure out how to solve the problem and so that tool solved it." OneNote fulfilled a need that the school had at the time, but it was apparent that it wasn't just a coincidence that Principal Organa happened to be the first person to model the software. This modeling by the head principal was a powerful communication to staff that resulted in widespread adoption of the software. Principal Organa didn't just simply model the software at one staff meeting. Organa had learned how to use the software and she used it for almost every communication with staff. Organa put leadership team meeting notes, communications to new staff members, schedules, PLC agendas and meeting notes to name a few. Assistant Principal Kanata summed up Organa and the administration team's detailed approach to using OneNote:

> Everything that we expect our kids and our teachers to be able a to use, we use. Everything, the handbook, everything in the world that you want to know is in OneNote. We have an evaluation OneNote page, where you go to get teacher evaluation information is through there.

Assistant Principal Kunb, who had a unique viewpoint as a part time assistant principal and part time teacher, described the impact of Organa's OneNote modeling:

> She presents opportunities for us, like all of our notes, our agenda for today, are all on OneNote, which is what we are using with our students. All of our students have OneNote notebooks and we push out information notes and tasks, everything through OneNote. She uses it as well. She's walking the talk, she's modeling it and that causes us to have to use it. And then once we use it they think, it's less scary, so now I can go use it in my classroom

Organa's modeling of OneNote was the example that was shared by a wide variety of participants during the study.

Principal Organa and her assistant principals described the importance of modeling throughout the entire study, but Assistant Principal Kanata even went as far as saying that the role of model of technology use became even more important as the initiative continued. Principal Organa reflected on the future and taking on the role of model of technology use:

> There may come a time when we do less of that (modeling), when were just trying to use what we got, but right now we've got people at all different stages of implementation, so I do think that we will continue to model and then the goal for me would be that we continue and I get teachers to model that even more.

While the importance of the role of model of technology use going forward for Principal Organa is uncertain, it has been a prominent and powerful role that Organa has played during the initiative thus far.

Technology Supporter

McGarr and Kearney (2009) found that sometimes principals play the role of part time technology support. Technology support is important with a one-to-one initiative because it ensures that devices that are being used continue to stay in working condition so that teachers can use them as tools in the classroom. In Assistant Principal Kanata's words, "What I always tell everybody is that technology needs to work first and after that we can do all kinds of wonderful things with it, but you can't skip the work part." Kanata described that this wasn't always true in the past at Naboo, "Everything has got to work as stupid as that sounds and that has been an issue we've had in the building in the past with Wi-Fi and everything. We've had past issues with things not working to begin with." Principal Organa put various supports in place before the initiative began to ensure that the technology was working properly throughout the initiative.

To best understand Principal Organa's role as technology supporter during the one-to-one initiative, it is essential to understand the technology support structure she put in place at Naboo for the initiative. Principal Organa made some changes before the first full year of the initiative began to help provide more technical support for teachers. Organa created a technology support teacher position, a technology support teaching assistant, a one-to-one initiative student team, and transferred some technology coordinator duties to Assistant Principal Kanata to help provide supports for teachers. Principal Organa started the Help Desk, which is a technology lab that was comprised of a technology support teacher, Mr. Dameron, and a technology support teaching assistant, Miss Antilles, who both helped support teachers and students with technology issues. The technology support teacher worked at the Help Desk for the majority of the day whereas the

technology support teaching assistant worked at the Help Desk all day. Mr. Dameron and Miss Antilles led the one-to-one initiative student team so students could help teachers and other students with technology issues they had in the classroom. Principal Organa assigned Assistant Principal Kanata to be over the Help Desk, the technology support teacher and the technology support teaching assistant. By making these changes Principal Organa was able to better support the staff members who had technology issues.

By establishing these technology support structures, Principal Organa enabled herself to focus her leadership efforts in other areas during the initiative. This point was emphasized in a response Organa gave in her second interview, "I've got people that have know-how. Because I really feel like tech support, I feel like that's being handled." The supports Principal Organa put in place meant that she rarely had to take on the technology supporter role during the initiative implementation

In addition to the Help Desk and other technology supports put in place, it was evident that all members of the administrative staff had the capacity to take on the role of technology supporter. Assistant Principal Carlissian reflected on the team's role as technology supporter:

> You have some teachers that they are going to have to have their hand held and as an administrator you have to become comfortable with that and just figure out ways, 'Well what are small ways that you can start to do that over time.'

While technology supporter wasn't a predominant role of the administrator team during the initiative, there were some teachers who needed some additional help during the initiative that Assistant Principal Carlissian referred to, "With them is just being more patient. So that's what I'm talking about like handholding and they are slowly getting there more and more and more."

Aside from putting supports in place and answering the technology support question from time to time, Principal Organa also helped ensure that technology support was a priority and that support was provided for all stakeholders. Organa had a "Tech Update" portion of a leadership team meeting that informed the team of any pertinent technology support topics. Assistant Principal Kanata communicated this update at the meeting and shared that the technology was running smoothly at the time and asked the leadership team to be mindful of the laptop pieces that are breaking off of devices when students unplug the devices from charging. Principal Organa also regularly sent home a parent communication newsletter and in the August newsletter answered frequently asked technology questions from parents, such as:

> If my child accidentally leaves their laptop at school in their locker, how can he or she complete their homework? Can a student edit his or her files on their home computer? Is it possible to print from the student laptops at home?

Additionally the newsletter had a one-to-one initiative section that was drafted by the one-to-one initiative director, Mrs. Jinn, that detailed the specifics of how to print at home with student devices. In the staff OneNote digital notebook, Organa included a technology support page that she had created for the staff which outlined how to open a shared OneNote notebook. Even though Organa seldom took on the role of technology supporter, these were all small ways that she utilized to provide technology support to the staff, students and parents.

Interviews and observations found that over time staff members needed less and less technological support. As the semester progressed, staff members asked less technical support questions of administrators and the Help Desk and teachers' use of technology went more smoothly. Assistant Principal Kunb talked about this trend:

> We did anticipate a lot of hardware issues in the beginning. Which was a leadership concern. Do we need to pull other personnel to support in the Help Desk? They did get slammed pretty hard at the beginning of the year but that has tapered off. The students have learned to troubleshoot and manage a lot of the issues that originally came up.

Almost all members of the study spoke about how far the staff progressed during the first semester of the initiative and teachers and students became more comfortable with the devices, which meant that by the end of the first semester people in the school had to play the role of technology supporter less often.

Leader of Organizational, Structural and Policy Change

Principal Organa has made a commitment to challenge and change traditional organizational structures throughout her career. When she first became a principal in the Lake District, Organa made a concerted effort to grow her new school in the use of instructional technology. Organa had a technology coordinator at the time, but he was a full time classroom teacher and she knew that for her school to grow in instructional technology use, she would need to find a way to provide the technology coordinator with time outside of his classroom to better support the teachers with utilizing technology in the classroom. Organa made the decision to hire a part time teacher so that the technology coordinator could have a half-day to fully commit to being a technology coordinator. Organa slowly changed the organizational structures of the school and found a way to ultimately make the technology coordinator role permanent at her former school. This ingenuity in changing structures began early in her career as a principal and has continued into her time as a principal at Naboo Intermediate School during the one-to-one initiative.

Organa made some unique changes in her organizational structure to best support her school in the implementation of a one-to-one initiative. These changes ultimately were rooted in Organa's experience with her former technology coordinator at Naboo Intermediate School. The previous technology coordinator held a traditional technology coordinator role where she supported teachers and students with technology problems. In Principal Organa's opinion, things were not going particularly well with the technology coordinator in her first year of the position and the technology coordinator decided to resign. Organa reflected on the position and the situation the technology coordinator's resignation put her in:

> So we had to restructure, join in and plan in the middle of the year. I interviewed for the job and sitting in those interviews every single one of those people including Mr. Dameron, I knew they weren't ready to be all that. So that's how I ended up with this structure that I have in place because I wasn't going to put somebody else in a position of that importance that couldn't handle it.

Thrust into a difficult situation, Principal Organa had some important organizational decisions to make and in her words, "I very much make lemonade out of lemons, if something doesn't go well, then you figure it out and the next time you don't make that same mistake." Based on the interviews Organa conducted, her knowledge of what the school needed to successfully transition into the one-to-one initiative and her knowledge of her administrative team's strengths, Organa began to contemplate a totally different structure going forward:

> As I reflect back from where I am now to over a year ago. Tuesday was right at a year ago that my technology coordinator, the person that was in that role resigned. So it was a year ago this month and that's when really, I was struggling with just managing the

> current technology as it was and I knew I wasn't necessarily leveraging people's strengths to the maximum potential. And I knew that the one-to-one initiative was on the horizon and I was concerned about how we could do that and I had Early Adopters in place. So what I really reflect back on that, at that moment in time it was January 2015, is that leader of that whole change of roles and it's really not infrastructure of change, but I guess it really falls into the role of visionary because I had to think outside the box. I had to think outside of the roles that we had in our system. To me if I reflect back on what was the key of us getting to where we are today and our success, it was that piece of being able to go to, it doesn't matter what the labels are, I have to leverage people's strengths and I had to figure out something that works for us. With the people that I have in place, how can I leverage their strengths? So really that was key, and it wasn't just me, but I had a lot of discussions with people. What do you think about that? I had a lot of discussions with Assistant Principal Kanata and Assistant Principal Carlissian and Superintendent Kenobi. Can I do this? I can't find the perfect person. I think this job is too big for one person. I can't fail here. We can't fail here. I guess that goes back to that visionary piece and that really falls into then identifying and knowing my staff and we have talked about that of who are the experts and how can I leverage what they do really well.

Assistant Principal Kanata recalled upon this junction for Principal Organa, "She looked at us and she said I've got the expertise right here to do a lot of this job already, so let's not do it the standard way, let's change everybody's job description to best utilize us."

Organa's approach was very unconventional and it was based mostly on the idea of "leveraging people's strengths." This was a phrase that I heard repeatedly during the study from Organa and her administration. Leveraging everyone's strengths meant a change in roles for the administrative team and other employees.

The decision to adjust to an unconventional organizational structure meant that Assistant Principal Kanata would take on a portion of the traditional technology coordinator duties. Organa did this to utilize her strengths and in an interview called Assistant Principal Kanata, "a very logical, sequential person that can plan and do things to the nth degree." Kanata had twelve years as technology coordinator under her belt and she was able to use this experience to set up technology structures in the building to ensure that technology worked. Throughout the initiative Kanata oversaw the Help Desk, technology support teacher, technology teaching assistant and made the school software decisions. Kanata essentially took on the traditional technology coordinator role, but Mr. Dameron did the more hands on work of supporting teachers and students with any technology problems they had.

Principal Organa made no changes to what grades Carlissian and Kanata oversaw or what subject areas they were over, but Organa did shift their roles into more of TPaCK coaches where they would help coach teachers to utilize instructional technology in their assigned subject area. This unconventional assignment of TPaCK coaching duties to the assistant principals was different than the majority of the other Lake District schools who generally appointed a specific person other than the assistant principal to take on the role of TPaCK coach.

Principal Organa assigned Mr. Dameron to the role of technology support teacher and Miss Antilles to the position of technology support teaching assistant. Both of these positions

worked out of the Help Desk and Mr. Dameron taught one class a day. Their Help Desk structure was similar to that of other Lake District schools, but Mr. Dameron focused his efforts on teacher and student technology support and because of Kanata's help he didn't have to take on the technology coordinator responsibilities like at most other schools.

Finally, in order for Assistant Principals Carlissian to take on the TPaCK role and for Kanata to take on the technology coordinator and TPaCK role, Organa hired Assistant Principal Kunb to help support the administrative team as they took on these new roles. Assistant Principal Kunb worked in the assistant principal position half of the day and described her duties:

> My job is to come in and take their responsibilities that Assistant Principal Carlissian and Assistant Principal Kanata can offload, just the menial things like bus problems, discipline issues, RTI, which are all important things that have to be managed, but by pulling some of that workload from them, that frees them up to address technology issues and the one-to-one initiative.

In my observations it appeared that Kunb took on more of the administrative duties so that the other assistant principals could focus their efforts on the one-to-one initiative and instruction. When I spoke with Assistant Principal Kanata at the end of the semester, she reflected that the role changes and addition of principal Kunb allowed her to spend more time as an instructional leader, "I feel at this moment I spend most of my time in the world of technology coordinator and instructional coach. Maybe even more instructional coach." This was important to hear because shifting the assistant principals roles to be more instructionally focused was a big reason that Organa made the organizational changes in the first place.

The interview participants agreed that the organizational changes seemed to be working well after one semester of the initiative. Assistant Principal Kunb shared her opinion about the effectiveness of the non-traditional structures put in place:

> To me we're doing this differently than some of the other schools. We're very different and I know Principal Organa had to talk to the superintendent and she said here's my crazy plan, what do you think? Thank goodness he's open-minded and he was like yeah, give it a shot. Let's see if we can do it. I think it's been pretty effective, at least from what I've seen in my experience and what I've seen with my students and conversations with other teachers in the building.

Assistant Principal Kanata proclaimed, "the structure she set up is working well and the whole changing jobs and the whole change in jobs and that whole mess administratively to support teachers has worked well." Assistant Principal Kunb also believed that the structural changes that Organa made had been successful:

> I really think that team approach is what made the difference. I don't know if in our culture one person could have done the technology coordinator position. So by splitting it up and making it a team effort, or making it a family effort, I think that was probably the singular most powerful thing she has done to make this successful for our school.

The structures put in place and the team approach Kunb referenced actually seemed to make Principal Organa's job easier. Organa referenced how the structures affected the support she gave during the initiative, "Quite honestly I haven't had to personally do a lot of the supporting because of the structures that I have in place." The way that Principal Organa led as the role of

leader of organizational, structural and policy changes not only made her job easier, but it also helped provide teachers with the support they needed during the initiative.

Leader of Change of Pedagogy and Learning

"It is important to acknowledge that the mere presence of a technology-rich environment is not sufficient for enhanced teaching, learning or added value" (Dunleavy et al., 2007) essentially summarizes the role of leader of change of pedagogy and learning. How does the school principal help ensure that the one-to-one technology is used to enhance teaching and learning? Principal Organa and her administrative team believed that she had to take on this role throughout the initiative. As Organa explained her roles, "The lead learner in terms of pedagogy of learning, but I also share that very much. I expect Assistant Principal Kanata and Assistant Principal Carlissian to do that as well." When addressing Organa's role as a leader of change of pedagogy and learning during the initiative, the role meant that Organa had to be a TPaCK coach at times, a lead learner, a communicator of expectations and a connector of people.

Even though Principal Organa gave both Assistant Principal Carlissian and Assistant Principal Kanata the role of TPaCK coach, this didn't mean that Principal Organa didn't have to take on this role at times. Assistant Principal Kanata explained the role of leader of change of pedagogy and learning:

> Leader of change and pedagogy and learning, I think we're all playing that role. I think that's the TPaCK coach and I think what she would consider that the most important role and thing that we (administrative team) do. I think we all have a piece in that.

Principal Organa was still able to support teachers as a TPaCK coach at times during the initiative and she generally took on this role when she was doing walkthroughs or evaluating.

Principal Organa explained how she acted as a TPaCK coach in observations during the initiative:

> It's got to achieve the learning task. So to me it's all about the learning and the tools that you used to get them there and engagement and if it allows students to be more engaged. So I think every day when I go in and do and watch a lesson, that's what I base it on. I did an evaluation yesterday and there are a couple of things that I will recommend the use of technology in.

Principal Organa went on to explain the details of a formal evaluation conference where she was supporting a teacher in the TPaCK coach:

> When I meet with her this afternoon, I'm going to give her some very easy things to start with and then I'm going to give her some other things, because there are some things to produce, or the end product to be shared that she could use OneNote with. But I'm not going to start there. So to me her learning goals were met in her lesson. There are some things that she could have used technology wise that I think would have increased the engagement. The learning was great and that's priority one. So I think that would up the engagement and the ease of sharing, so I'll share those. I don't think it has changed a whole lot because it's still all framed around the learning task.

Because of Organa being somewhat of a digital expert and model technology user, she had no problem assuming the position of a TPaCK coach in walkthroughs and evaluations during the initiative.

Organa also played the role of leader of change in pedagogy and learning by being a lead learner during the initiative. By being a lead learner Organa was able to influence teachers' use

of technology to enhance teaching and learning. Organa constantly referenced herself as the lead learner of the school in interviews. This idea of lead learner described her approach to the leadership of the initiative so much that there was even a reference to being a lead learner on her bio on the school website. Organa believed so much in being the lead learner of the school that during the initiative she believed that any training or professional development that her teachers were expected to go to, she would go to as well. Organa explained:

> We've talked about always attending those conferences and always attending professional developments and that's kind of my philosophy about anything. I'm a learner and I need to be there. I don't need to be in here working while everybody else is in professional development or sending emails or whatever. I need to be learning as well.

Being a lead learner was a part of Organa's role of leader of change in pedagogy and learning and enabled her to help teachers improve and enhance their pedagogical practices.

Principal Organa frequently took on the role of leader of change in pedagogy and learning by communicating her expectations of how teachers should use their one-to-one technology to enhance their instruction. Organa expected technology to be used with a purpose and didn't want teachers to be using technology to just to say they used technology. Organa described her expectations in her second interview:

> What I wanted for our teachers was, for them to plan their lessons and get things to work and for them to be able to have choices and tools to deliver instruction and to engage students and to differentiate and those sorts of things.

Assistant Principal Carlissian summed up the Organa's expectation of how to use technology to improve pedagogy and learning by asking the question about the teacher's use of technology,

"Did it take the lesson deeper? Did it help them master the standards? Did it keep the students engaged?" Ultimately Organa didn't set a specific expectation of technology use because she wanted the focus to be on the learning and instruction first and not the technology. Carlissian shared, "We purposely never said you have to have your device out 25% of the time. If today it doesn't make sense to have your device out, then don't have a device out." Principal Organa explained how the Early Adopter process shaped the technology expectations she communicated to her staff for the initiative:

> Most of the time the tech piece is very much just a part of the instruction. We've pretty much told our teachers, because we went through this last year with our Early Adopters, and they were like now how often should I be using them. I said I'm not answering that. Obviously they can't be gathering dust, but they don't have to be used. If you are just using it as substitution, you can if it serves that purpose, but you have to decide what that is. So we spent a lot of time on that last year. On our power standards form we had a technology integration piece that we highlighted and we said this is the level of integration we saw today. We have kind of moved away from that because I think our staff is beyond that now. I hired people that were really, really comfortable with technology, so I wasn't concerned about it. Now it is much more about teaching and learning. And that has been a very purposeful focus, is this good for the learning? Is this the appropriate tool and did it help with that. So I don't look at that as much.

Principal Organa and the other administrators shared that teachers not using their devices was never an issue for them at Naboo. So while Principal Organa did not have a specific technology use expectation for teachers, she did expect teachers to grow in their use of technology to

enhance pedagogy and learning. Organa explained, "We wanted them obviously growing in their use of technology and that's our expectation that they're continuing learning and that they are continuing to use the technology." Principal Organa shared her philosophy on growth:

> Our philosophy is we use technology in the workplace and it's a part of our lives and our kids are those digital natives and they love it and we just have to figure out the best way to capture it for their learning. So it's kind of like a nonnegotiable, but you get to pick your pace, you get to pick your path. You get to pick your pace here and we'll let you know if it's not serving the kids, and then we'll push you a little bit. And I can say to you, 'I'm going to have my hand on your back on this. But I have this hand out here if you fall, but I won't let you fall bad and hurt yourself.'

Organa's focus on growth was a way she took on the role of leader of change and pedagogy and encouraged her staff to grow in the way they used their technology to enhance teaching and learning.

One other way that Principal Organa took on the role of leader of change and pedagogy and helped push teaching and learning in her building was by connecting teachers within her building. Assistant Principal Carlissian felt that Organa was "keenly aware of who in the building is excelling using different types of technology." Principal Organa described the importance of connecting teachers within her building to help them learn from one another and push their own teaching:

> Finding that key person that can help you in that area. To me my job in supporting is making sure that all those people that are supporting along with me, like today working with a teacher for an observation and I'm discussing technology use, it's finding a

> connection, it's saying, you want to do this, this is who you need to talk to. This should be your first line of support and knowing the people and sharing the pieces. And then with other teachers it's, 'Oh I want to do this', well talk to this person, that is who is doing that well in my observations.

By connecting teachers to other teachers who were excelling with ways to incorporate technology in the classroom, Organa helped raise the quality of overall instruction in the building. Organa's role as a leader of change of pedagogy and learning during the initiative sometimes meant that Organa had to be a TPaCK coach, a lead learner, a communicator of expectations and a connector of people.

Leader of Cultural Change

Increasing the use of technology in a school is about changing a school's culture and not just having and using the technology (Chang, 2012). Principal Organa was keenly aware of her school's culture and frequently took on the role of leader of cultural change throughout the initiative. Assistant Principal Carlisian felt that Organa was "really good" at this role and Assistant Principal Kunb even went as far to contend that Principal Organa's ability to build a strong culture was a big reason of why the initiative was so successful after one semester. Essentially Principal Organa took on the role of leader of cultural change in two ways: building a strong culture before the initiative began to help provide a successful starting point for implementing the initiative and leading the building in cultural change while the one-to-one initiative was being implemented.

Participants in the study were able to describe some important areas where Principal Organa built a successful culture before the initiative began. By taking on the role of cultural

change before the initiative began Organa was able to influence the initiative and help establish a culture conducive to implementing a one-to-one initiative. Assistant Principal Kunb shared, "Again it's that culture, it's that trust, and teamwork. Once you have that in place, you can get a staff to do just about anything." Kunb alluded to the fact that if Principal Organa established a successful culture before the beginning of the initiative, success would be more likely during the initiative. Principal Organa was in a particularly unique situation as a principal because she had the privilege of opening Naboo Intermediate School three years prior to the first year of implementation of the one-to-one initiative. This meant that Organa was able to build the school's culture from its initial opening. Organa had the belief that she had five years to build the culture of the school:

> I think the biggest thing I had to do and it's just because of the circumstances and opening a new building and where our teachers were. I had this plan of really you have five years to set your culture. This is my belief from all the schools that I've been in and after that five years, it is really hard to change the culture. So I felt like I had to protect that and really build it. So in the things that were going as well as I would've liked them to, I think the one-to-one initiative helped me to really get on that.

According to Assistant Principal Kunb, Organa built a culture of trust and teamwork and a culture that had a family feel. Assistant Principal Kunb explained that Organa tried to make Naboo feel more like a family:

> We had to re-create culture. We had teachers coming from all over the system. They came from over three close by districts. You have all these people coming together and you have to make a family of those people. How do you do that? I will tell you it is not

by accident that she did what she did. I think she was very prescriptive in setting up her teams. We did a lot of personality profile tests and things like that before she set up the teams and that's not saying that she stuck us with everybody that was just alike. It was actually just the opposite. We balanced each other and we complemented each other, so I'm going to say my perception is that she has a natural knack for that and she looks for that and when she was trying to figure out how she was going to implement the one-to-one initiative at the school. That strategy fit her leadership style and also fit our culture. I think it was very planned.

Kunb also reflected on some of the things Principal Organa did the first year the school opened to build a culture of trust:

> When I say culture, we had to build. That first year was difficult. I think Principal Organa was very purposeful and everything she planned to build this culture. Some of the activities we did were really silly goofy stuff, like scavenger hunts and tours of our community and just doing fun interesting things together to get to know each other and build up trust. Because she's very energetic, yet open and real. I think you have to build that trust, so that you can have those open conversations. A lot of times resistance is founded on fear. If you can eliminate the fear in a school or reduced spirit in a school, I think you reduce the resistance.

In addition, before and during the initiative Organa also built a culture that centered around the questions “How does that benefit our kids?” and “Is it what is best for kids?” In her first interview Organa described how she was incessant about asking these questions to staff before making any decisions:

> I have spent a lot of time in every meeting when a question is asked, whether I'm either up in front or someone asked me, I would say how does that benefit our kids? I would say if learning and our kids are number one priority then is this the right decision for them?

Organa shared that because she posed this question to staff so many times, it was almost a running joke with staff where they would jokingly say all the time to each other, "How does that benefit kids?" Assistant Principal Carlissian described how the school culture centered around these questions, "All of our conversations start out with what's best for students. So you have to get away from the talk from what's easiest for teachers to what's best for students because that's not the same conversation." By establishing a culture before the initiative began centered around asking the question, "Is this what is best for kids?" Organa was able to pose this same question during the initiative to see if teachers were using technology in their classes with a purpose. Organa's role of cultural change before the initiative began should not go unnoticed because it was these efforts that helped establish the culture that was in place when the one-to-one initiative was implemented.

Once the one-to-one initiative began at Naboo, Organa's role of leader of cultural change shifted to focus more on the actual initiative itself. One of the big concerns with the initiative that Principal Organa shared with me was her fear that by adding so many devices the school would lose the relational piece of their culture. Organa described:

> I don't want us to lose the relationship in our culture piece when we are integrating technology because it can shift your focus and I need to make sure we stay centered on that and so I will share little bit of that. I think you just need to keep that balance and

that's my job to just keep watch of what's going on and making sure we are still having the face-to-face and building that culture that causes everything else to go well.

Assistant Principal Kunb shared similar concerns when I asked her about her initial reaction to learning the district was adopting one-to-one devices:

My initial concern was are we going to lose the heart of education, our society? I didn't want to lose that connection with our students and my computer, these phones, those can be barriers to that communication. So for me, that was my biggest concern, number one.

This relationship piece of the school culture was so important to Principal Organa that she even included it in the school's mission statement. The mission statement read, "Naboo Intermediate School will create challenging and meaningful learning experiences for every student while building strong, positive relationships. We will SOAR to New Heights!" One example of how Principal Organa took on the role of leader of cultural change during the initiative is when I observed her presenting a professional development session titled, "Capturing Kids' Hearts: Strategies for a Strong Start." At the time of the presentation Organa had recently attended a conference that focused on building relationships and a positive school culture and in the professional development she led she shared what she learned from the conference. It also was one of her attempts to help the school to not lose its relational focus because of the addition of one-to-one technology. In her presentation Organa shared ideas like, "In every encounter, it should be our goal to make that person better" and she shared about using "SOLER: Square Up, Open Posture, Lean in, Eye Contact, and Relax" when listening to students. The professional development was attended by many Naboo teachers and it gave them an opportunity to learn about strategies to help students feel as if they had been heard, which ultimately helped teachers

and students to build more solid relationships. One very interesting reflection was in Assistant Principal Kunb's end of semester interview where she reflected on her initial concern of the devices taking away from teachers' relationships with students. Kunb outlined:

> I was really worried about was it deterring relationships and everybody being too much on their computers. But now because we're interacting over computers there are times where I'm like, 'How do I get this again?' and the kids can respond to that. It's building relationships in a way.

As the researcher observed students in classes during the initiative, the researcher actually observed students building relationships with one another through helping each other with technology and the researcher also witnessed them help their teachers out with technology, which like Kunb mentioned, helped students and teachers to build stronger relationships. Principal Organa's determination to not lose the relational piece of the school culture because of one-to-one technology was evident in the study and her efforts appeared to have an impact on the culture during the initiative.

Principal Organa also seemed to take on the role of leader of cultural change by creating a culture during the initiative that gave teachers permission to fail. Assistant Kunb reflected on a book, *Mindset: The New Psychology of Success* (Dweck, 2008) that Principal Organa had the staff read and discuss the book the year before the one-to-one initiative was implemented to help the staff feel more comfortable with failing:

> At the beginning of last year we started talking about the 'Growth Mindset' and allowing yourself to fail and the growth that comes from failure. After going through this technology transition, there's a whole lot of failure. You try something and it's not going

> to work. Some days the laptops are not going to do what they're supposed to do and you have to go to Plan B. So that and reading that book and for us to know that as a staff, gave us permission to forgive ourselves when we fail and by doing that it also allowed our students to say it's okay to fail. As a science teacher I'd use it all the time and teach our kids and say, it's an experiment, it's all an experiment. It is fun and great when somebody else makes a mistake. So yeah, knowing her, that was her plan last year to prepare us because she saw what was coming down the pike.

Kunb even went on to explain how important it was for teachers to hear this message from the administration as they were trying out and learning new things:

> They were constantly, as they were leading they were always telling us don't be afraid, try it at your own pace, it's okay to make mistakes, you're going to teach a lesson and it's going to bomb and that's okay, just try again.

Principal Organa also created a culture where it was ok to fail by not putting any stringent requirements on how often teachers needed to use technology. Also Organa's focus on growth also added to the teachers' comfort with failing and building an overall culture that even encouraged failing.

Lastly Principal Organa took on the role of leader of cultural change by focusing on building a positive culture during the initiative. Organa believed that building a more positive school culture would positively affect the implementation of the one-to-one initiative. This was not a big change for her because Organa always approached her job with a positive attitude. In fact, there were quite a few times during the interviews with Principal Organa that I would hear her say various forms of the message, "I very much make lemonade out of lemons." This phrase

was an example of her dedication to being positive and creating a positive culture. While positivity seemed to always be an attribute of Principal Organa, building a more positive culture was a more intense focus for Principal Organa during the study because of the initiative and her recent visit to a conference that focused on building relationships and a positive culture. Organa was focused on sharing the good things that were happening in the school with staff and students whenever she could. Organa called her focus on positive things around the school, "Tell Me Something Good." During one school visit, I shadowed Principal Organa and she led the morning announcements over the intercom and took time on the announcements to share encouraging things that students had shared with her. Organa shared positive comments from students including promising things happening in students' lives or helpful things other students were doing for each other. At the end of the announcements Principal Organa encouraged students to email her with any encouraging things they wanted her to share in the future and she told them she would read them on the announcements. This was a daily routine at Naboo towards the latter half of the semester and a way to focus on building a positive culture. I even went to a staff meeting during the semester where Principal Organa started out the staff meeting by playing the song "Tell me Something Good" by Rufus featuring Chaka Khan (Morris, 1974). Organa sang and danced to the song in front of the staff and then explained to them about an activity at the conference she attended. Organa explained the activity asked for participants to share anything good going on in their life. Principal Organa did this same activity with the staff and staff members shared a variety of positive things about their lives. One teacher shared about going to Disney World over Fall Break, while another person shared about successfully potty training her kid. Teachers shared a wide variety of great things and the activity lasted for

probably close to ten minutes and was Organa's way of starting the meeting off in an encouraging way and also her way of adding to the overall culture of the school. I also witnessed Organa doing a similar activity in a leadership meeting that was at the end of the semester. Organa started out the meeting with this and one teacher shared about her daughter receiving a teaching job, while another shared about getting engaged. They even stopped the meeting to watch the video of the teacher's engagement on the screen. All these activities were part of Principal Organa's "Tell me something good" initiative, and while they may not seem to directly relate to technology, they had a way of impacting the culture and making it more positive, which supported the one-to-one initiative. Overall there were many things that Principal Organa did before and during the initiative to take on the role of leader of cultural change so that she could lead, support and influence the implementation of the one-to-one initiative.

Evaluator of Technology

The evaluator of technology role was one that was difficult for participants to reflect upon because it was role they rarely had to take on. In fact, Principal Organa shared in our first interview, "I can honestly say to you that we don't have any rocks that we're having to pull along. I don't have anywhere I have to say either get on board or get out." When asked the question, how have you ensured teachers are using their one-to-one technology to positively impact their kids, each member of the administrative team admitted that they really didn't have to do this. Principal Organa felt that the teachers even put pressure on themselves to use the one-to-one devices. Principal Organa reflected on her overall approach to being the evaluator of technology:

> It's not this, I'm going write you up if you don't do it, but this is the right thing for kids so we have to be on the path to do it. So I guess that and if I had somebody that had the devices stacked over there, I would call them on it. You know, but in a, 'well you could be doing this, what about using this.' I also don't think our kids would allow them not to be used or for them to sit there with their laptops closed the entire class.

Naboo Intermediate School administrators had to spend very little time during the initiative ensuring that teachers were using their devices in class.

Even though Principal Organa mentioned that she spent very little time as an evaluator of technology, she shared that she played the role of evaluator of technology in the past before the initiative began, "I think it has been a theme since when we first came here. We did do the whole thing about giving them feedback about the integration of technology in the classroom." Principal Organa explained that they did this by giving teachers feedback about technology use when they went into classrooms for walkthroughs to give feedback:

> We made it very much a part of the feedback form and we just highlighted what we saw and then I think at that point that was a very important thing because we had our power strategies on there and the power things we were really paying attention to. Which was questioning, academic feedback, integration of technology and I can't remember the other thing we put on there. So we wanted to make sure we provided individualized feedback.

Organa mentioned at that time they were focusing mostly on ensuring that teachers were using technology:

> Our point was, whether technology was being used or not, it was a quick feedback form for teachers and it was based on power standards. So we did that one-year and had a

communication about it, just when we were infusing technology.

Since the start of the initiative, Principal Organa shared that Naboo's focus has shifted from ensuring technology was being used to ensuring technology was being used to help learning:

> We have kind of moved away from that because I think our staff is beyond that now. I hired people that were really, really comfortable with technology, so I wasn't concerned about it. Now it is much more about, and that has been a very purposeful focus, is this good for the learning? Is this the appropriate tool and did it help with that?

This new focus meant that the administration stopped using the previous walkthrough form that included an evaluation of technology integration and shifted their focus more to using technology with a purpose.

Even in her rare role as evaluator of technology, Organa still used a few vehicles to evaluate teachers' use of technology and to ensure that teachers were using technology with a purpose during the initiative. One vehicle she used was formal teacher evaluations. Principal Organa felt that the evaluation system helped her evaluate the use of technology during the initiative, "My only concern right now is continuing to take the temperature of whether we are continuing to move forward and to me we do that through our teacher evaluations." In an interview, Assistant Principal Kanata discussed the idea of using formal teacher evaluations to evaluate how technology was being used in the classroom:

> The last observation I did was a social studies literature teacher. The information I gave her back was partly around the rubric and partly around how you could've used technology to do it a better way. We're all doing that little influencing piece as we do that.

Another way that Principal Organa was acting as an evaluator of technology was through walkthroughs. Even though the administration made the decision to take out the technology integration part of the previous walkthrough form, Organa still used walkthroughs to gauge the teachers' use of technology in the classroom during the initiative. Principal Organa rarely took on the role of evaluator of technology during the initiative, but wondered if she would have to take on this role more in the future to best meet the needs of the school.

Encourager and Supporter

School leaders must provide support and encouragement to their staff throughout a one-to-one initiative to have a successful implementation (Argueta et al., 2011). Principal Organa frequently took on the role of encourager and supporter throughout Naboo's one-to-one initiative. In fact, Organa and the other administrators referenced her taking on this role in almost every interview that I conducted. Assistant Principal Carlissian shared, "Encourager and supporter, Organa is always out there rooting teachers on and recognizing them." Even Organa herself claimed in her first interview, "I'm a big encourager and supporter." When I asked Organa and the other three administrators about the top three most important roles that Organa took on during the first semester of the initiative, the majority of the administrators, including Organa herself, thought that encourager and supporter was one of the top three roles that she played during the first semester. When I spoke to Principal Organa around the middle of the semester, her need to take on the role of encourager and supporter for her staff not only continued, but seemed to increase as the initiative progressed. Organa reflected mid-semester about the need for her to continue to be the encourager and supporter for her staff, "My staff and

just reflecting on them and where they are, I just have to continue to be the encourager and supporter of them. I need to make sure that they have what they need."

Assistant Principal Carlissian even saw Organa shift her role to more of an encourager and supporter as the semester progressed, "She's gone more from modeling to encouraging. She would say, 'We are doing this great, we are doing this great, have you thought about?'"

Encourager and supporter was a prominent role for Principal Organa during the study and participants shared many examples of how Principal Organa took on this role. As I shadowed, observed and spoke with Principal Organa during the initiative it was evident that she was constantly encouraging and supporting her staff in everything she did. This was interesting because Organa admitted that she wasn't the type of person that needed much encouragement herself:

> I don't need that many positive affirmations, I don't need people to blow me up, I don't need that, I'm good. I have enough self-confidence in myself. So I just always assumed that life is good unless you're telling me otherwise because I don't need that, I know that other people need that, and that is why I always view my teachers as kids, because I always do that really well with kids. Because I felt like they were learning and they needed my love support and encouragement, but adults need the same. It helps me to view them as my children because then I'm going to do that. I'm going to love, support them and encourage them. I'm viewing them that they're still growing instead of that they have arrived.

Even though she didn't need the encouragement and support herself, Principal Organa seemed to fully understand the importance of providing encouragement and support for her staff. Assistant

Principal Kunb shared some of Organa's encouraging words, "Get in there and get your feet wet and give it a try, it's going to be okay. Allow yourself the time to do this." Kunb explained some of the encouraging words she heard from the team, "They were always telling us don't be afraid, try it at your own pace, it's okay to make mistakes, you're going to teach a lesson and it's going to bomb and that's okay, just try again." Organa reflected on one reason why she had to play the role of encourager and supporter during the initiative:

> I think the teachers, just the very idea that the district spent all this money, and I have all this, so I have to use it and I have to use it at this level. So I spent more time going it's okay. If that didn't work, always have a plan B, you can do this.

While the majority of the teachers at Naboo Intermediate School were fairly technologically proficient, Organa also had to play the role of encourager and supporter to encourage teachers who were not as adept at technology. Organa shared an example of how she encouraged and supported one of her teachers who struggled with technology during the initiative:

> We have one teacher that probably has more concerns and lack of confidence around technology than anybody else in the building, and you know she is good instructionally, but lacks confidence. And so making sure she has the support she needs and giving her a little bit of extra time and encouraging word and putting her at the right time and place when I do professional development with people and sending her to things. Not really pointing it out, but saying hey would you like to go to this because I know you're using this tool and I know you want some time to work on it, would you like to go visit this at the junior high because I would really like for you to do that. Trying to leverage the

> strengths that she has instructionally with the tools that I know that she might be able to use.

Organa also mentioned that she encouraged teachers during the initiative through walkthroughs and evaluations. Organa reflected on a time during the initiative that she encouraged a teacher through a walkthrough to meet her particular needs:

> I know her and I know she is a person that needs that from me. She needs an affirmation and she is one that gets really, really nervous when I come in and evaluate her. She is great, but she is constantly wanting everything to be perfect.

Principal Organa encouraged and supported teachers in a variety of ways during the initiative and throughout my interviews this was very apparent to her administrative team.

Some interview participants spoke more about Organa's role in supporting teachers than encouraging teachers. "As far as support, she will help out in any way that she can," shared Assistant Principal Carlissian. Principal Organa discussed the importance of being supportive of teachers by simply being available for them, "I think a lot of it is just being available, even if you don't have a purpose and you're out there during the five minute walk-throughs and being available to the teacher that wants to show you something." Principal Organa was also very supportive of new teachers during the initiative because she had quite a few new teachers that started at Naboo during the first year of the one-to-one initiative. Assistant Kunb shared the support Organa and the administrative team provided for new teachers:

> I think the toughest part has been just bringing our new people on board. That's been hard for new teachers because the rest of our staff has been through this process. You and I have talked about how we were part of this last year and we have all had this framework

> and we had this trust, we have this community and we have 12 new teachers coming in. So it's really important to provide that support and kind of help them get to where we are because right now they're pretty much blindly trusting.

In an interview Principal Organa explained how she was able to both encourage and support a new teacher through the avenue of a teacher evaluation:

> In the post conference I just did, it was all about encouraging and supporting and making sure that that teacher had what she needed and that she didn't feel the pressure to have to use technology, while she is making this transition into being a teacher. Even though she wants to, making her feel like it's all about teaching and learning rather than necessarily having everything in Blackboard or making sure she has a class notebook in One Note or whatever.

Organa's encouragement and support she gave the new teacher very much aligned with her no pressure style and focus on great teaching over technology to implementing the one-to-one initiative. Overall, the encourager and supporter role was a big piece of Principal Organa's leadership of the one-to-one initiative and it seemed to be a natural role for her that helped teachers in their adoption of one-to-one technology.

Family and Community Engager

Throughout the initiative Principal Organa and her administrative team described the role of family and community engager as a role she had to take on during the initiative. All of her fellow administrators mentioned her taking on this role and Assistant Principal Kunb explained, "She was a family and community engager, constantly talking to our parents and constantly

utilizing technology." While people around Principal Organa saw her take on this role, Organa identified with this role as well:

> Family and community engager because I think being on the front lines you are the person that is the visible one and you are the one who is communicating the message. We did our Show Up nights, and I'm the one up in front of our families that they look to about this and that opportunity.

Principal Organa went on to share, "I'm the vision and the voice of the family through our parent organization and through all of our community events. That's a huge part of our role."

Principal Organa's role as family and community engager extended throughout the semester I studied the initiative, but it was especially a role she had to play more frequently at the beginning of the semester:

> In my role with particularly at the beginning of the year, a lot of that, a lot of the one-to-one initiative and our 'Show Up' nights were me. With our parent organization I'm the person that meets with them and they are supportive of that.

The Show Up nights are nights held at the beginning of the school year that historically bring the teachers and community together so that parents can meet their students' teachers, learn important information about the upcoming school year and ask any questions they may have. This year the principal purposefully focused the night on many technology topics because it was the very first semester of implementing the initiative. Organa asked parents to bring their student and their device to the event and she had various technology-centered activities. When the parents went to their students' homerooms, Organa had the parents watch an Office Mix, a video of assistant principal Kanata narrating PowerPoint slides about how to access Blackboard,

PowerSchool, the student grades and attendance site and Renaissance Home Connect, a site where parents could see what books students have read and what scores they had received on the STAR test. At the end of the evening, Organa brought the parents together to ask any technology support questions they had. This night was a big focus for Organa and she even created a School Messenger message, a phone and email message that gets sent to every parent at the school, to ensure that parents attended the event and brought their student and their device.

In addition to the Show Up nights and community events, Organa had a prominent role on the Naboo parent organization. I attended a parent organization meeting and reviewed several parent organization meeting agendas and no reference to the initiative was made in these meetings, but Organa recognized this as an important part of her role as family and community engager, "I'm the vision and the voice of the family through our parent organization and through all of our community events. That's a huge part of my role." Organa also reached out to the community and regularly sent home a newsletter to share important information and upcoming events. In the August edition of the newsletter Organa dedicated a section of the newsletter to answering frequently asked questions that parents had regarding the one-to-one technology. The same newsletter had a section written by the one-to-one initiative director, Mrs. Jinn, which outlined how to print from the one-to-one student devices at home. The school website also had a page dedicated to helping support parents with technology. The particular website page that I viewed had instructions for parents on how to get students electronic calendars on parent devices. Principal Organa took on the role of family and community engager at certain points during the initiative, but it wasn't a major role for her during the initiative.

Leader of Ethics in Technology

Leader of Ethics in Technology was not a role that Principal Organa had to play very often during the initiative. This, however, was a role the administrative team was aware of and a role they seemed to take on more frequently than Principal Organa. In the second interview I asked Organa about this role and if anything had changed about having to take on the role since I last spoke with her and she replied:

> Well, I will say just because of some situations where kids are getting more comfortable, maybe the leader of ethics and technology, because in some staff situations and some student situations that we've been debating over. What are response is to this and how big is this and how will you respond to it because of where kids are going to with their devices, they're going to make some choices with it and make some poor choices with it and adults, unfortunately. So that's been a little bit of a shift. That's just like in the short term. In the moment that's what is in in my head because I haven't spent a lot of time on it.

During that particular interview, Organa was dealing with some more extreme student and teacher ethical issues, so the role was more prominent for her at the time. In that same interview, Organa talked a little bit about how their team was approaching being more consistent when dealing with student disciplinary and ethical issues. The administrative team attempted to be more consistent in dealing with disciplinary issues by implementing what they jokingly called the "Wheel of Justice." Principal Organa reflected on the term:

> It's our little term and it's because Assistant Principal Kanata and Assistant Principal Carlissian, early on were both administrating discipline and we didn't want our discipline

> standards to be based on distant administrator personality and we wanted some consistency because they rotate with grade levels so we can give appropriate responses for certain things. So we just started recording on our spreadsheet different violations and how we responded.

This was a simple solution, but one that Principal Organa thought helped the team be more consistent when dealing with digital citizenship issues or other disciplinary issues.

The only other way that the role of leader of ethics in technology arose was when Principal Organa brought up the idea of the "digital divide" in an interview. Once the initiative was adopted Organa began to question the idea that just handing a student a device eliminated the "digital divide" as evidenced in her remarks during her final interview:

> Well, I think it has made me question, because one of the things we have talked about was the whole idea of if it would narrow the gap, the haves versus the have-nots. I don't care who you are, you have that range of kids with different needs and so it has made me think about what truly the basics are of that and does that really happen. We've done some articles and studies and some professional learning groups about that. Just handing a student a device it doesn't..... you want to say, well I've given this kid something they haven't had before, but does it do that?

While this questioning didn't appear to change the way Organa led the one-to-one initiative, it was definitely evidence that she was continuing to process through how to ensure that Naboo teachers and students were using technology to close the "digital divide". The role of leader of ethics in technology was not a role Organa utilized very often, but her assistant principals

frequently took on the role during the initiative as students became more comfortable with the one-to-one technology.

HR Harriet

As I navigated through a large amount of qualitative data, most of the themes I found fit under roles that I discovered in my review of literature of instructional technology leadership. There was one role that stood out to me that didn't fit under any of the roles I discovered through research. This role specifically focused on hiring the right people in order to implement a one-to-one initiative. Principal Organa coined this her "HR Harriet role":

> I do think, that I had my 'HR Harriet hat' on in the summer and all I did was hire people this summer, but hiring is the most important thing that you do because I can't do all those jobs and I have to have people that are competent and have buy-in and all those things that fit all of that.

While this wasn't a role that Organa had to take on during the semester I studied the initiative, she spent a lot of time in this role the summer before the initiative began. Due to teacher retirements and other teachers leaving, Principal Organa had to hire 12 new teachers during the summer before the initiative began. Organa mentioned that the teacher retirees were very strong instructionally, but were not very strong in technology, so she admitted that the one-to-one initiative could have been part of the reason why they decided to retire. HR Harriet was a role that Organa had taken on many times since she opened Naboo. In fact, Organa recollected that she had personally hired over half of her staff and the remaining teachers transferred from other Lake District schools when Naboo first opened.

In relation to the initiative, hiring teachers before the initiative began was a very important component of implementing the one-to-one initiative. Principal Organa explained about the importance of hiring:

> Every time you hire someone it's a continual piece of that. But I do think you have to be very non-negotiable about getting that right, and sometimes how you do it you're not always confident, but I think that is number one. But I do think that is hugely important because I can support and influence and lead but if I don't have a person that has the desire and the capacity and the right personality and all those things to do that then I'm just beating my head against the wall.

Organa was very specific throughout our conversations about the type of teachers she hired. Organa rarely hired inexperienced teachers, "For most of the time we hire experienced educators. We don't usually hire someone right out of college." Lake District was such a desirable district to work in based on the districts' reputation, pay and other factors, that Organa had the privilege of having a large number of applicants for teaching jobs, and she was able to usually focus her efforts on hiring experienced teachers. Organa looked for teachers who were innovative. Organa shared:

> That's part of hiring. One of the things you want is you want people that are innovators, that are learners, that aren't stagnant in the role as an educator and if they're not those things, and they're not a learner and willing to do whatever it takes to do the best for the kids, then we need to help them on out.

Organa described her affinity for hiring teachers who were willing to try out new things:

> I didn't hire a teacher even before that was unwilling to grab at whatever tools will benefit their kids. Just because they're learning curve might be behind. One of our best teachers is one of the oldest members of our staff. It's so cool because it's so unexpected. Part of what I love about her is that she's willing to try and if it doesn't work she'll get someone to help her and she'll get someone to help her figure it out.

Not only did Organa hire people who were innovative and were willing to try out new things, she also hired people who had a "willingness to learn." Principal Organa did concede that even though her focus was on hiring great teachers, she did hire people who were in her words "really, really comfortable with technology." Organa reflected on a teacher she hired who she was impressed with because the teacher had been in a digital teaching program in Florida and had taught a flipped classroom. While many of the people Organa hired were technology proficient, she did explain that, as time went on, she looked less for teachers who were just comfortable with technology and more for teachers who asked the question of technology, "Is this good for the learning? Is this the appropriate tool and did it help with the learning?"

Principal Organa took the role of HR Harriet so seriously that she even changed her teacher interview processes before the initiative began to help ensure that she was hiring the best people for the initiative. The interview process change partially stemmed from Organa's bad experience with hiring the previous technology coordinator. Organa explained that the technology coordinator was not the best fit for the job and the experience may have driven her to adopt more performance based interview practices. Principal Organa explained the evolution of her interview practices:

> So the problem with me and the good thing and the bad thing with me is that I never do the same thing the same way twice. I'm constantly evaluating and I've learned some things. I do believe in performance-based interviews, but each job performance-based interview has to be different. So I kind of have, I started out and did a standard interview and then got into performance-based interviews and did the lesson and did the collaborative planning session into the long interview. Love that and then last year it evolved into a video lesson, so in order to see their tech skills and that kind of thing.

The summer before the initiative began, Organa adjusted her interview structure to include two interviews. The first interview was usually done over the phone and was Organa's opportunity to ask some questions of the candidates and vet through the applicants to determine her top eight to ten candidates. In the next step of the application process, applicants were asked to submit a video lesson to Organa and the administrative team. The video lesson could be a lesson the interview candidate had already filmed or the candidate could create a new lesson at home or with a class. Organa reflected in an interview of why she had candidates submit a video lesson instead of giving a sample lesson in person:

> Another school did where they have people come in and present a lesson to the committee and I don't really like that because that's not real. I need to see how they interact with kids. I just took that idea and said, 'Let's do it with kids', and then I was like, I like it even better with the kids you currently have because most of the time we hire experienced educators. We don't usually hire someone right out of college. To me they need to have that as a part of their practice and with a lot of the TPEG stuff, they were already videoing the lessons, so some people already have a lesson that's videoed or

whatever. If I do it in the spring, they can video where they currently are and that kind of thing.

Organa also shared that this type of interview practice helped her to see what type of technology skills the teacher had, "I learned a lot because I learned a lot about their tech skills with that. Did they submit it on a flash drive, is it on Vimeo (video sharing site like YouTube), is it on a site, did they have it captioned?"

Once she hired the teachers, Organa's role shifted to ensuring that the teachers were in the "right seats". Organa contended, "My role of support is putting the people in the right places." Organa elaborated:

> It's about getting the people in the right seats on the bus and getting the people that are in the seats that don't need to be on the bus off. I do think that is key. Then if you have the right people on and you're leveraging the right strengths, that makes the whole rest of your job so much easier. So I do think that is key and as a leader I think that's your number one, hiring the right people and getting the right people in place that fit well together, I do think that that's our number one job.

In Organa's end of semester interview, she consistently reiterated the importance of hiring and putting people into the right positions.

Because of the focus of the study and because both Assistant Principal Carlissian and Assistant Principal Kanata were so technologically knowledgeable, I was particularly interested in whether or not Principal Organa purposefully hired technologically proficient assistant principals. I asked this question to Carlissian, Kanata and Principal Organa at the beginning of the semester. Both Carlissian and Kanata didn't think Organa did this purposefully, but instead

hired them for their curriculum knowledge and their instructional leadership. In Carlissian's words:

> The fact that we are fluent in technology was a bonus that she sought after the instructional leader part and because she has two instructional leaders it allows us to be involved with this (the initiative). If you have someone that can't instructionally lead than knowing how to use technology can be pointless.

When I asked Principal Organa about whether she looked for technology proficient assistant principals, she answered the question by saying:

> This is my philosophy about administration; I hire great teachers to go into administration. That's what I believe and that's the only way you can be authentic. Assistant Principal Kanata was known as a great teacher, Assistant Principal Carlissian was known as a great teacher and a great relationship person. And they both had different experiences, one with elementary and one with middle school. So I had an idea of what I wanted to do, but Miss Netal's (her technology friend) influence again. I look for a little bit of a risk taker and someone who wants to use emerging technology, I couldn't go with someone who isn't interested in technology.

So while Principal Organa had no idea that the district one-to-one initiative would eventually be adopted when she hired Carlissian and Kanata, she did look for assistant principals who had an interest in technology and this was a factor when deciding upon who to hire to be a part of her administrative team. Whether it was hiring teachers or assistant principals, the role of HR Harriet was a role that Organa took on before the initiative began, but a role that in Principal Organa's opinion had a big impact on the success of the initiative.

Summary of the Analysis of Research Question One A and B

The previous section examined the study's qualitative data through the lens of the first research question:

1. How do principals lead teachers in the implementation of a one-to-one initiative?
    a. How do principals support teachers in the implementation of a one-to-one initiative?
    b. How do principals influence teachers' use of technology in the implementation of a one-to-one initiative?

Because the participants in the initiative had a hard time separating the idea of leading, influencing and supporting the initiative, research question one and the subparts were analyzed together. The section included the analysis of qualitative data collected from interviews, observations, principal shadowing, documents and archival records. Through the analysis of the data, codes emerged and most codes aligned with one of the twelve a priori themes that were detailed in the literature review. The roles that emerged were visionary, digital expert, manager of resources, model of technology use, technology supporter, leader of organizational, structural and policy change, leader of change in pedagogy and learning, leader of cultural change, evaluator of technology, encourager and supporter, family and community engager and leader of ethics in technology. The theme HR Harriet was added as a theme because through analysis of the qualitative data, certain codes did not align with any of the twelve a priori codes. The top three most cited roles that Principal Organa held during the initiative were visionary, model of technology use, and encourager and supporter. Teacher interviews detailing perceptions of the

principal's efforts to lead, support and influence teachers in the implementation of a one-to-one initiative will be discussed in the next section.

Analysis of Research Question Two

This section examines the study's qualitative data through the lens of the second research question:

2. How do teachers perceive the principal's efforts to lead, support, and influence the teaching staff in the implementation of a one-to-one initiative?

Similar to question one, teachers had a difficult time separating the idea of leading, supporting, and influencing the initiative. Because the teachers had a hard time separating these ideas, the ideas of leading, supporting, and influencing will be mostly grouped together when analyzing question two. However, when reporting the findings I will detail if a participant limited their response to the lead, influence or support categories or whether the categories were grouped.

This section analyzes the qualitative data from the perspective of four teachers and one technology support teacher. Two technology support teacher interviews and four teacher interviews were analyzed for a total of six interviews to answer research question two. The teachers all taught different grades, a variety of subjects, had different amounts of teaching experience and mixed technology proficiency levels. Because of the diverse backgrounds of the teacher interview participants, an overview of the participants' background follows.

Teacher interviews were analyzed and codes were created from the question, How do teachers perceive the principal's efforts to lead, support, and influence the teaching staff in the implementation of a one-to-one initiative? The codes were then assigned to the same thirteen a priori themes that were outlined in research question one. The thirteen themes will be described

in detail in the next section and the findings will be compared to the principal's perceptions of their own leadership efforts during the implementation of the one-to-one initiative. The rankings of the teachers' perceptions of the roles Principal Organa took on while leading, influencing and supporting the one-to-one initiative can be found in Table 5. The rankings are based on the coding totals for each role during the data analysis.

Background of the Teachers

Purposive sampling was used to identify teacher interview participants in this study (see Chapter 3 for further details). I identified teacher interview participants through the interviews with the principal, assistant principals and through classroom observations. I did this to ensure that I interviewed teacher participants with an array of teaching experience, different levels of technology proficiency, and a variety of attitudes toward the initiative. Each teacher also taught

Table 5

Rankings of the Teachers' Perceptions of Principal Organa's Roles

Role Ranking	**Principal Organa**
#1	Model of Technology Use
#2	Encourager and Supporter
#3	Visionary
#4	Leader of Organizational, Structural & Policy Change
#5	Digital Expert
#6	Manager of Resources
#7	Technology Supporter
#8	Family and Community Engager
#9	Leader of Cultural Change
#10	Evaluator of Technology
#11	Leader of Change in Pedagogy & Learning
#12	Leader of Ethics in Technology
#13	HR Harriet

Note. Rankings are based on coding frequency totals for each role during data analysis.

a different subject. Interviewing a wide variety or participants, allowed me the opportunity to study the principal's leadership of the initiative from an array of perspectives. Table 6 outlines the teachers' experience, subject they taught and overall self-reported technology proficiency. During their interviews teachers rated themselves on a scale of 1 to 10, with 1 being the lowest technology proficiency and 10 being the highest technology proficiency. Overall the teachers brought a vast amount of teaching and technology experience, which added to the richness of the data in the study.

Visionary

In the analysis of Organa and her administration's responses, visionary was the role that appeared more than any other role. When speaking to the teachers and hearing their perceptions, this was the third most referenced role for Principal Organa. In the interviews the teachers

Table 6

Teacher Interview Participants from Naboo Intermediate School

Participant	**Years of Experience**	**Subject Taught**	**Technology Proficiency**
Teacher A	≥25 years	Math	6
Teacher B	≥15 years	Language Arts	7
Teacher C	≤5 years	Reading/Social Studies	5
Teacher D	≥15 years	Science	10
Mr. Dameron	≥10 years	Math/Technology Support	10

Note. Technology proficiency ratings were self-reported by teachers and teachers rated themselves on a scale of 1 to 10, with 1 being the lowest proficiency and 10 being the highest proficiency.

frequently referenced her taking on the visionary role. Mr. Dameron felt that this was one of the roles that Organa took on during the initiative that stuck out the most and one of her top three most important roles. Teachers not only recognized that Organa took on the role of visionary during the initiative, but they repeatedly shared the importance of having a principal who is a visionary. Teacher B shared, "I think your leader or your administrator can set the tone and the mood for the whole school. The atmosphere." When Teacher C was asked about the importance of a principal's role in a one-to-one initiative, the participant responded, "I think the principal's role is really important because they kind of set the tone for the school and for whatever is being implemented." Just as Principal Organa had shared herself, "I do think that the person at the top in any organization sets the tone," these two teachers also commented on the importance of her setting the tone. According to one teacher, Principal Organa first sets this tone or vision for the school through her motivation and enthusiasm:

> Principal Organa gets us all hyped up about whatever it is she wants us to do. So, seeing that motivation and enthusiasm about it, just kind of pulls you along. It makes you want to learn it, it makes you want to do well as a teacher and it just get you hooked in.

Teachers noticed her excitement and the impact it had on her vision during the initiative, but they also spoke consistently of her ability to be on the "forefront" of all things technology. "She's a visionary and she's one of the front runners or trailblazers, saying okay I'm using it, you should too," said one teacher. Another teacher discussed her characteristics as a visionary, "definitely visionary because she is always, we are always, I feel like on the cutting edge and we're always trying something new or piloting new programs." Teacher A shared some specifics of her ability to stay on the forefront of things, "She is a visionary. She's always doing some type of research

and sending out the information to read articles. This is what I see in the future and this is what I'm thinking in your classroom. It's just amazing." Teacher A gave an example of how her forward thinking and "cutting edge" focus impacted her and her classroom during the one-to-one initiative. Teacher A shared that Organa sent her some information on student led conferencing and because of this the teacher researched the idea and decided to "pilot" the idea in her classroom. The teacher, however, ran into a problem when quite a few parents couldn't attend the student led conferencing. This teacher began to panic about what to do and shared her concerns with Organa and Organa began laughing and said, "Oh, God, love your heart. The laptops have a camera." Organa encouraged her to have the students tape their student led conferences that they conducted with their parents. The teacher hadn't thought of this innovative idea and decided to utilize Organa's idea and have the students use their laptop cameras to film their student led conferences over winter break. Teacher A reflected about this example and said, "She is just so into the technology and I love it because it has made me challenge myself."

Teachers acknowledged the vision Principal Organa laid out during the initiative and the vision strongly aligned with what Organa and her administrators shared in their interviews. Mr. Dameron shared Organa's vision "Put the kids first, make sure they are learning what they need to be learning and for teachers to push themselves in technology." A clear piece of the vision that Organa seemed to articulate well in the eyes of the teachers was the vision and communication that technology shouldn't be used just to be used. Just as Organa and the assistant principals detailed her vision of teachers using technology with a purpose, teachers seemed to hear this message loud and clear and it was a very meaningful message to them. Teacher B explained the specifics of this message or vision:

> They know that we are all in different places and that's okay and that's another thing that she did was make us all feel comfortable with that in the beginning and it wasn't a forced down your throat, you have to use all of this and be at this level…… it's okay to not use everything all of the time.

Mr. Dameron described how powerful this vision was to teachers:

> I like that she says that if technology is not the best way to teach a lesson, then don't use it, but if it is, then do it the best you can and I love that and you're not going to hear that from a lot of principals.

When I asked Mr. Dameron how Organa communicated this vision to the teachers he responded:

> Staff meetings, personal communications. It just comes out. I hear from a lot of other principals and it's like, we have these devices and we need to use them. And for her it's like are you pushing higher-level thinking? And if computers can't help you do that, then maybe this isn't the best lesson to use computers with.

This vision of using technology with a purpose and not using technology just for the sake of using technology was extremely meaningful for a specific teacher in the initiative who was a novice teacher. The new teacher shared that he was originally very nervous about adopting the one-to-one initiative because of his self-perception of having low technology proficiency and because of the pressure associated with the initiative. This teacher explained how Principal Organa's vision impacted his initial apprehensiveness about the initiative, "I feel more comfortable now because I don't think my administration expects me to always have a device out." This teacher shared that this vision was clearly communicated by Organa during the summer before the initiative began and any time the Naboo staff got together during the initiative

for professional development. This participant not only reflected on how meaningful this vision was for them, but the participant also shared how important this role was in relation to the other things Organa did during the initiative:

> For me, there was no pressure on using iPads and going full force. I really appreciated that. I didn't feel like I had to be somebody who I'm not right now. In my opinion, that's the best thing that she has done.

The majority of the perceptions that teachers held about Principal Organa taking on the role of visionary were also shared by Organa and her administrative team. The teachers' perceptions of this role and their alignment with the principals' perceptions only strengthened the validity and importance of Organa's role of visionary during the initiative.

Digital Expert

Even though Principal Organa described herself as a "digital wannabe", one teacher in particular was willing to call her a digital expert. Teacher A shared, "she is definitely a digital expert and, if she is not, she goes for it and she learns it until she does become one." Mr. Dameron talked about how he and his colleagues, who were technically proficient, often commented on how impressed they were with her digital expertise, "It's sometimes annoying, because she is better at things than we are. Like her OneNote notebooks are spectacular and it's annoying because they shouldn't be. She shouldn't have time to make them that pretty." Principal Organa and her administrative team commented on some of her technical expertise, but they hesitated to describe her in the digital expert role and most of teachers in the interviews seemed to agree. Mr. Dameron shared, "I don't know if I would call her digital expert, she is definitely

borderline." Teacher C also struggled with calling her a digital expert, but he did highlight the fact that Organa was constantly learning when it came to technology:

> She doesn't strike me as someone where it comes naturally. But I know she puts the time in to figure it out, because I usually leave at five or later and her car is still here. So I know she is working hard to make sure she is ready and that she can help us with it. I think she has put the time in to be able to try to help us to the best of her ability.

While some acknowledged her digital expertise, most admitted that they didn't see her taking on the actual role very often during the initiative. Teacher D recognized her digital knowledge in some areas, but shared that Organa is not the person the participant would depend on to play the role of digital expert:

> Digital expert, she is about some things, I don't know necessarily… She's really good about listening and learning things like that, but if it came down to doing a Gizmo (a science computer program), I would not go to Principal Organa about how to use a Gizmo, and why would she? I think she just needs to offer support and say, 'Hey here is this software and I'll make sure it works for you and that we pay for it.' I think that's the only job she needs to know how to do.

Overall, teachers hesitated to call Principal Organa a digital expert, but still described her as a technically proficient principal.

Manager of Resources

With question one, Organa and her assistant principals shared many details about how Organa played the role of manager of resources when it came to software. The teachers also brought up her role as manager of software resources in their interviews. Teacher D shared:

> If we find a piece of software or something, I know I've gone to her about some things and been like, 'Hey there is this, this and this,' and she is like, 'All right. We also do this,so is it going to be better than that or not?'

Teacher D also explained that Organa sometimes responds with, "Well, sit back and wait for this other thing that might be coming and if you like that better, it's okay, we'll do that." In teacher D's words the administrative team was very diplomatic about software decisions, "Whenever something comes up, they're like, Oh yeah we saw this, but we also saw this. They don't really shoot you down, but they're very diplomatic about it." Teachers shared an example of Principal Organa taking on the role of manager of resources during the initiative was when she bought school wide software programs like Study Island and Explore Learning. Whether it was these programs or other software decisions, Mr. Dameron commented on her being the ultimate decision maker in regards to technology purchases, "You know she is over budget, manager of resources and she is the final say on all that." He took his comments on her taking the role of manager of resources even further by sharing about how Organa is willing to support them at the district level when it comes to technology purchases, "She will go to her office and fight for us and she does a good job at that." During the discussions with teachers, most felt that Principal Organa played the role of manager of resources primarily by making software purchasing decisions.

Model of Technology Use

Model of technology use was a role that stood out to teachers as much as it did to the administrative team. In fact, this role was the highest coded role according to teacher perceptions. The teacher interviews only solidified how important this role was for Principal

Organa during the initiative. Both Mr. Dameron and Teacher D specifically mentioned in interviews that Organa taking on this role during the initiative stood out more than any of the other roles. Mr. Dameron reflected about his impressions after the first staff meeting of the year:

> The first faculty meeting of the year she's using technology and using programs that we would use in our classroom to show I'm not in the classroom, I'm your principal and I'm doing it. She's a very quiet leader in technology, but she's always using technology and modeling it and demonstrating it.

Dameron's response to the first faculty meeting of the year was, "I'm thinking this is really cool, because she understands what teachers are doing." Teacher C felt that Organa's modeling during the initiative helped introduce technology to the staff:

> It helps to have your administration model the technology that they want you to use. Its nice to see them using it. Even in leading a faculty meeting. If you are using something that you want us to implement, well that gives us a little introduction to it. So it does help.

Modeling helped introduce technology to teachers during the initiative, but it also induced curiosity among the staff, "She is very optimistic about programs she learns and when she learns them she introduces them to us and it brings up our curiosity." Just as the administrative team discussed the parallels of Principal Organa modeling for teachers and teachers modeling for kids, teacher A also commented on this connection, "You know, it is almost similar to a teacher's role. A student is going to see the teacher as a role model. Teachers see the principal and administration as the role model." Mr. Dameron believed that her modeling went to a different level, "She leads by example in everything she does whether it's taking an angel off of a tree

downstairs or using Kahoot in class or modeling proper conversation with a kid who was hurting. She is just fantastic." Teacher A felt that her modeling reached the level of being a "role model" and discussed this idea in her interview:

> She takes her leadership to the point, that it is such a high level of role modeling, whether it be with technology, whether it be the good old schoolmarm old fashion way or whether it's just the fact that she cares. She takes her role and the definition of leadership beyond the level of leadership.

This level of modeling was powerful for Mr. Dameron and he reflected on it in his interview:

> To me, if she weren't doing that, I would probably be less likely to do it. Just because it's like, well, when I see her do it, I know it's important because I know it's not easy for her. She has so many other things and she already works to 11 or 12 o'clock at night, but then she's putting in time to make sure she's using Kahoot for professional development? It's important.

In the eyes of teachers, the role of model of technology use seemed to epitomize Principal Organa just as it did in the analysis of question one.

Teachers were able to share some clear examples of her taking on the role of model of technology use during the initiative and most examples occurred in staff meetings. One example Teacher A shared was when Principal Organa decided to have teachers sign into the staff meeting in a more innovative way than the traditional way of just signing your name on a piece of paper. Principal Organa had the teachers take a "selfie" picture of their table group making funny faces and had them send it to her. Principal Organa pulled the pictures up on the

Activboard and showed the staff and later posted them on the staff OneNote notebook. This may seem like a small thing, but it stood out to Teacher A and impacted her teaching:

> That is so cool. And I was sitting here thinking, How can I use that? And I thought, Oh I know I can use that. And I'm thinking attendance because my students have my cell phone number. My students have my cell phone number and most teachers wouldn't do that, but I'm not most teachers.

Organa's simple innovative use of technology helped influence a teachers' use of technology in the classroom. The administrative team discussed at length about the power of Principal Organa's modeling of the program OneNote and the teachers agreed and discussed in detail how Principal Organa's modeling of OneNote greatly impacted the staff. Just as the principals described, it all happened in the first staff meeting. Mr. Dameron reflected upon that influential first day of the school year:

> She sits down at that very first faculty meeting and opens up this program and says this is OneNote, let me show you how it works. I have created this tab and this tab and this tab and in there I have created all of these files and you can find this here.

Dameron went on to explain more:

> She passes out our teacher handbook this year and it's on OneNote and all of our teachers are saying I don't even know how to use OneNote. But your principal was sitting there and she was the first example the teachers saw using it.

Mr. Dameron described the staff's reaction to Principal Organa's introduction of OneNote on that first day:

> She was really the first one to use OneNote. It's kind of cool because I had seen it, but to sit back and watch the other teachers go, 'You can have a notebook? And we can all see that notebook and we can all collaborate in the notebook?' That was really cool to see in the first staff meeting.

According to teachers, Principal Organa continued to use OneNote throughout the year. Organa put the staff handbook on OneNote, meeting agendas and minutes and even more as Teacher B described:

> Our staff handbook is digital and is on OneNote. Things they send to us, it's all out there and everything that we do is on OneNote. So we see that she is using it and when we go to faculty meetings anything that is on the screen, so she is implementing it and she is leading by example.

Teacher C mentioned that Organa also conducted all staff meetings through OneNote. Teacher A discussed the power Principal Organa's modeling had on her, "Every time I see Principal Organa use OneNote, I think okay, if she can do it, I can." Principal Organa's original intention was just to model OneNote for the staff the first year, but a large number of teachers quickly began to use OneNote in their classrooms and the program proliferated throughout the school. Teacher D reflected on the extent to which OneNote spread throughout Naboo Intermediate school:

> I mean they learned OneNote and were able to model it for us and we were able to take off with it to an extent that that I don't necessarily think that they knew some people were going to do.

All of the teachers I interviewed during the initiative regularly used OneNote in their classrooms except for one teacher. The majority of teachers used the program because of the modeling of Principal Organa and because the program seemed to meet the teachers' needs. All of the teachers that I interviewed assured me that Principal Organa never required the staff to use OneNote. The massive spread and use of OneNote as an instructional tool at Naboo Intermediate School, all began with Principal Organa's modeling at the first staff meeting.

While Principal Organa was regularly highlighted in the main role of model of technology, the teachers also acknowledged this as a team effort. Almost all of the teachers didn't just speak about Organa taking on this role, but they often used the word "they" to describe the modeling of the entire administrative team. One teacher shared, "They definitely are model technology users, because we see them using it at faculty meetings and in the way they communicate with us in our staff handbook and everything is digital." The fact that Organa and her administrative team cited her role of model of technology use the second highest number of times and the teachers referenced Organa's role as model of technology use more than any other role she held, only confirmed the importance of this role during the initiative.

Technology Supporter

The teachers thought that Principal Organa didn't specifically help people with technology problems in her role as technology support, but rather helped ensure that teachers had sufficient technology support. Teacher A was the only teacher that saw her take on the role of direct technology support. Mr. Dameron said, "Technology support, she doesn't really have a hand in that." The other teachers seemed to think more along the lines of Teacher D:

> She is really good at making sure there's technology support and good technology support there and encouraging that. She just wants things to work for people, that's her big thing and it's kind of my thing, if it doesn't work people are going to say, 'Why am I going to get that out today if it doesn't work?'

Most of the technology support that the teachers discussed involved the Help Desk. Teacher D shared a previous experience with the former technology coordinator who was in charge of the Help Desk:

> The technology czar person [Laughter] wasn't always great about emailing you back when there was a problem. They weren't always the greatest about getting back to you about whether or not something was going to work or not. They would work it out sometimes, but you never knew if they were or not. But the new group is really good about going, 'Hey we have had this problem or we've not had this problem or we're working on it or were doing this.' It's a little bit more partner-ish with the new group than before.

The teachers described the Help Desk as a great resource for both teachers and students. Teacher C shared how important having this technology support was to him, "I just think with the support, we have the support that we need. That's big because a lot of people are like me and they didn't feel completely ready on their own." Ultimately, teachers felt that Principal Organa didn't usually help teachers with technical problems, but rather put structures in place to ensure that teachers had the support they needed.

Leader of Organizational, Structural and Policy Change

The teachers were not as well versed about the detailed organizational and structural changes that Principal Organa made during the initiative as the administrative team, but the teachers were still very cognizant of the major changes she made to help support the initiative. Organa had a history of challenging and changing traditional organizational structures throughout her career. One of the teacher interview participants even knew about the organizational changes Organa made at her previous school. Teacher D referenced how Organa changed her former school's technology coordinator role from being full time in the classroom and providing technical help to teachers, to where the technology coordinator taught half the day in the classroom and provided technical support the other half of the day. The teachers recognized that Organa took on the role of leader of organizational, structural and policy change during the initiative and referenced mostly how she made personnel and organizational changes to help support the implementation of the initiative. The teachers mentioned Organa's decision to split up the technology coordinator job among many people and teacher D reflected on this decision:

> Last year when we lost our big technology coordinator, that job got split up amongst other people and I think that was very wise where you don't have the Technology Czar in the school that holds all this stuff and that is the gatekeeper for all things.

Mr. Dameron was one of the teacher interview participants who shared thoughts about Organa's role as leader of organizational, structural and policy change. Dameron spoke specifically about the Help Desk and the people Organa assigned to work together at the Help Desk:

> Principal Organa really did delegate 98% of this to Miss Kanata, myself, and Miss Antilles, but she picked the people that would do the job the best. Does that make sense? And she picked people that would work well together. When I look at it, that was her role in this whole thing. It was who can I put together for extended hours. We were here before school started until seven or eight o'clock for two or three nights just making sure everything was ready to go. Who can do that and not pull each other's hair, or pull their own hair out? She put together a great group, a great threesome that really does look at this as our job. We enjoy technology, we have good senses of humor and we can spend a lot of time together and be fine. That was really her role when I look back at it.

In the eyes of the teachers, these changes to the Help Desk were very successful. Teacher C reflected on these changes that Organa made as leader of organizational, structural and policy change:

> They have been really good. You can let Mr. Dameron know you have an issue and he gets back with you like that. So having those people in the positions that they are in, also helps what we do here because they kind of… You know somebody has your back if you have an issue. So I appreciate our administration for putting people in that position. Because if we didn't have that it would be very….I guess frustrating at times.

The success of the organizational changes allowed for Principal Organa to be a little more 'hands off' with the Help Desk according to Mr. Dameron:

> She's very hands-off in it because she has Assistant Principal Kanata and she has Miss Antilles who she could trust in this process. I think if she couldn't trust the process I think she could be a whole lot more hands-on and take control.

Teacher C summed up Principal Organa's role as leader of organizational, structural and policy change:

> I just think she places people in roles that can help the teachers because you can't do it all. She has made sure that we have had other people that she delegated the responsibility to that would be able to help us. So I think she does a really good job with that.

While the teachers may not have mentioned as many details as the administrative team about Principal Organa taking on the role of leader of organizational, structural and policy change, they still referenced this role the fourth highest mentioned of any of the roles. The teachers responses helped solidify that Principal Organa's organizational and structural changes were an important part of leading, influencing and supporting the one-one initiative.

Leader of Change of Pedagogy and Learning

Even though the role of leader of change of pedagogy and learning was detailed by Principal Organa and the administrative team in the analysis of question one, the teachers shared very little about Principal Organa taking on this role during the initiative. Three of the five teacher interview participants mentioned the role, but they discussed very few specifics of her taking on this role. Mr. Dameron shared:

> As far as change of pedagogy and learning, she is the one that sets the barometer where she says push yourself in technology. I would not be surprised at all that we would come back next year and she says you've had a year to learn and now here's what I want from you. If she were to set a minimum standard for technology use I wouldn't be surprised.

Teacher C admitted that even though he was more of a novice teacher when it came to using instructional technology, he felt no pressure from Principal Organa to use the one-to-one devices

on a daily basis. Perhaps the fact that the teachers were in their first semester of the initiative influenced their responses concerning this role, but the role of leader of change of pedagogy and learning remained an important role from the perspective of the administrative team.

Leader of Cultural Change

Many of the things that teachers shared in regard to Principal Organa's role of leader of cultural change were things that were put in place before the initiative began. Teacher D stated, "The cultural change, leader of cultural change is very much a Principal Organa thing. If she gets excited about it, people see that and know." Teacher B discussed the positive culture that Principal Organa had established and how it impacted the initiative:

> I think she just creates such a positive atmosphere, that it makes you want to do well. It's like a coach. It's one of those that you want to do well for them and so if she tells us to do this, okay we're going to do it and she leads by example and showing you that.

Mr. Dameron spent a lot of time describing Organa's role as leader of cultural change and how she focused on facilitating a culture of student leadership in the building:

> Culture is completely her. We have student leadership in our building that is unequaled in our system. …We have expanded our leadership role for our kids and if you come to our leadership meeting you'll see a room full of lots of people making decisions and student representatives. It's not just a room of two or three people making decisions. So that role culture comes directly from Principal Organa.

Teachers also shared a little about the servant-oriented culture Organa tried to create. When I asked Mr. Dameron about this servant-oriented culture, he began to share a little about his interview process with Principal Organa:

> The previous person in the position wasn't that servant-oriented. When the teacher made a request it was kind of like it was a hassle. So maybe my attitude with that comes from when I interviewed for this job because that was a big push from Principal Organa, Assistant Principal Kanata, and Assistant Principal Carlissian…… when I interviewed the big push and a lot of the questions were do you have a servant heart? So when someone comes to you and needs something is it going to be something that's an inconvenience to you or is it something you're going to thrive with and you want to fix.

Mr. Dameron shared a story about a time when the teachers had a PLC meeting right before state testing and the teachers were feeling burnout and shared this with Principal Organa. Principal Organa "served" the teachers by canceling PLC meetings so that teachers could have more time for preparation in their rooms. Teachers did not reflect as much as the administrative team concerning Organa's role of cultural change, but they recognized some of the characteristics of the school culture that Organa had established in her role of leader of cultural change in an effort to support the one-to-one initiative.

Evaluator of Technology

The teachers shared very little about Principal Organa or her administrative team taking on the role of evaluator of technology. When I asked Teacher C the question, "So you don't feel like there's ever been like anybody walking in to check and see if you are using your iPads?" Teacher C responded with, "No, I've never felt like that." Teacher B didn't necessarily feel like she was being evaluated in her use of technology, but that it was an expectation, "I just think it's just an understood expectation that we need to use it." Teacher B didn't say whether it was the

district or administration that made her feel that way, but she did share more about technology use being encouraged:

> It was encouraged. We all do know it is highly encouraged to use and that's why we have them. They do come around and check and see what we are doing. We have to put our assignments on Blackboard, our learning management system, so you know, you should have your assignments posted weekly on the calendar. So that in itself, you have to use that piece of technology.

The other teachers didn't speak about being expected to use the one-to-one computers. While some thoughts were shared by teachers about the role of evaluator of technology, the role was mentioned very few times and did not appear to be a major role for Principal Organa in the eyes of the teachers. This seemed to suggest that teachers didn't feel evaluated in technology and didn't feel pressured to use it. Teacher C reflected on the importance of feeling no pressure:

> For me, there was no pressure on using iPads and going full force. I really appreciated that. I didn't feel like I had to be somebody who I'm not right now. In my opinion, that's the best thing that she is done.

In some ways not playing the role of evaluator of technology, may have had a greater impact on teachers during the initiative than if Organa did take on this role because it helped teachers not feel pressured.

Encourager and Supporter

Every teacher who was interviewed spoke about Principal Organa's role of encourager and supporter at length. In fact, this was the teachers' second most referenced role for Principal

Organa. Teacher B believed that everything Principal Organa did for the initiative began with the role of encourager and supporter:

> To me the encourager and supporter is the big thing because then everything else that's listed here, falls under that. If she weren't a great motivator and encourager and supporter then we might not be as willing to follow all the other things.

Many other teachers commented about her encouraging ways throughout the first semester of the initiative. Teacher D shared, "I think Principal Organa is very much an encourager and supporter person. Very supportive. Encouraging you to use it and encouraging you to do this." Teacher B specifically addressed how positive Organa was in her encouragement of teachers:

> Encourager and supporter, that's huge, again Principal Organa is very motivational and she is very positive and always tries to give us something positive, just like every morning she does the morning announcements, tell me something good, the motivational quotes around the building. That's encouraging and supportive for students and staff.

Mr. Dameron shared his thoughts on her positive encouragement and how it impacted the school, "She is the most uplifting principal. You could stink at being a principal and do that and still motivate your staff and do good things in the school. She does that and she does everything else excellently."

The teachers not only spoke at length about Organa taking on the role of encourager and supporter, but they also shared some personal examples of how she encouraged them during the initiative. One math teacher who was interviewed spoke about a math conference she was able to attend and the encouragement she received from Principal Organa when she returned to school. At the conference, the teacher attended many sessions on the topic of using technology

with math instruction and spoke with many teachers about how to best use technology in math. Many of the teachers shared that the best way to use technology in math was for students to have a tablet so they could handwrite their math problems on the screen of the device. The teachers from the conference shared that in their experience it was very difficult to use technology in math instruction if the students were working with a laptop. Because of this the Naboo teacher grew frustrated about the limitations of Naboo using laptops in math instruction and shared her concerns with Principal Organa upon her return from the conference. Teacher A shared Principal Organa's response to her frustration about the limitations of the laptops and her desire to have tablets:

> I said that to her, and of course being the lovely person that she is, being the optimistic person that she is, she said, 'Hey don't fret. In a couple of years that is probably what is going to happen because when we really start looking into the initiative and re-evaluating doing this and that, that is a possibility that we may do'. And I was like 'okay'. So again her optimism rejuvenated me saying, 'Okay I can deal with the chalkboards for two more years. I get to write on these cute little whiteboards.' Again, her personality and her persona is so up there that it's like, How can you go wrong?

Mr. Dameron, the technology support teacher, shared another example of Organa's encouragement during the initiative. Dameron shared Organa's response to the Help Desk team spending many hours before the school year started getting devices ready:

> I came in and helped out during my time off before school started. On the first day of school there was a gift on my desk from Principal Organa. There was a Scripture calendar, and every day it's a reminder that she appreciated what I did. She believes in

you and that are doing the best you can. Just little notes in the mailboxes and saying thanks for making the training and without you this stuff wouldn't be possible.

These stories of encouragement shared by the interview participants were incredibly meaningful to them and were a great example of how Organa took on the role of encourager and supporter.

The teachers also spoke at length about the supporter part of Organa's role as encourager and supporter. Teacher C shared, "Principal Organa has been really good about supporting us." "She's a strong supporter," echoed another teacher. When speaking about support, Teacher D spoke about the availability of the administration and Principal Organa during the initiative and the juxtaposition between the previous principal he worked for:

> Our administration is pretty out there and all of them are pretty much an open door if you need to go in there and say something or do something. I worked at a school prior to when I was in this county, and the principal's door was closed and was locked and the blinds were shut and it was like the wizard behind the window. Principal Organa is here for all hours and she hardly ever minds you popping in and saying, 'Hey can I do this.'

Teacher C described Organa's ability to support teachers by listening:

> Principal Organa has done a good job of listening. I guess you can call her an active listener. She always wants feedback and she doesn't tarry when she hears concerns. So she's ready to address concerns. Also, when she hears feedback she will say we're going to have a help session today.

Teacher D addressed the freedom of being supported and not controlled by Principal Organa:

> But support for her, I think it's just having people letting you do things with technology. Not controlling you. Saying okay this is what you are going to do. I think the school as

> far as leaders, I think leaders emerge in that and going, 'Hey this person is really good at that, go to this person. This person is good that, go to this person.'

Teacher D commended this freedom and the trust and support the staff is given to try new things:

> I think they are good about not saying anything is a bad idea. It's like okay, give it a try. There is a lot of trust. I think she realizes that if it is not working out for us then we can sit down and go, Hey that is not working out for me.

Teacher D even felt that Principal Organa got better and better at encouraging and supporting the staff as the initiative went on. The role of encourager and supporter was another role that seemed to exemplify Principal Organa and her leadership efforts during the initiative. All participants in the study raved about the way Organa encouraged and supported throughout the initiative, but did not indicate this was any different than before the initiative. According to respondents, this was a role that Organa personified since she had been named principal of Naboo Intermediate School.

Family and Community Engager

A couple of the teachers referenced Principal Organa taking on the role of family and community engager. Teacher A said, "Family and community engager, she is definitely a family and community engager. She is constantly communicating with the parents." "Family and community engager. She is all about getting people in the door even not during school hours," shared Mr. Dameron. Mr. Dameron felt that this was one of the top four roles that Organa played during the initiative. Dameron shared the same sentiment of Principal Organa and her administrative team, that she was in a sense "the face" of the school for the community:

> What she's amazing about with being the family engager is she is the face. When they think of this school, they think of her. Whether it's technology or not, she's the face. And she's a very highly thought of figure in the community. So if our community didn't like her, I don't know if there would be the same buy in. It's a lot easier to say I'm not doing this because she doesn't know what she's talking about than it is to say she is good and she knows what she is talking about and let's do everything we can to make this work. That's staff wide and community wide.

Dameron did mention that he observed Organa run into some challenges with parents during the initiative. He thought there were maybe twenty parents who were opposed to the adoption of the one-to-one initiative. Dameron, however, felt that Organa did a good job of working with these challenging parents in her role as family and community engager, "she's very approachable. I think that cuts down on a lot of that." He described one particular incident where Organa demonstrated her ability to work well with challenging parents:

> There was one open house night that Assistant Principal Kanata couldn't be here and I was dealing with some technology issues and there was a fired up parent and Principal Organa comes right in and swoops them up and deals with it and I never heard anything more about it.

Teachers mentioned Principal Organa taking on the role of family and community engager; however, specifics were difficult to report because teachers were not always around when she took on this role.

Leader of Ethics in Technology

Based on the teachers' perceptions, it seemed that the role of ethics in technology fell to the assistant principals or the team as a whole. The teacher perceptions were similar to the administrative team's perceptions of their own leadership efforts in this role. Teacher B shared that the team as a whole took on the role of ethics in technology:

> Ethics in technology, they talk to us a lot about that, even yesterday during our faculty meeting again discussing and making sure about what we're doing with students and using technology and any websites and making sure we are following what we are supposed to be doing, as far as their names being on things and stuff like that that might be digital.

The teachers did not report much about the principals taking on the role of leader of ethics in technology when discussing digital citizenship issues, but one teacher felt that the teachers and guidance counselors fulfilled this role. "Leader of ethics and technology, a lot of that falls to our teachers and guidance counselors. They do a big push with digital citizenship," shared Mr. Dameron. Teacher A reflected on the challenges of the seventh grade students and the importance of involving parents and students with digital citizenship conversations in the future:

> Oh, digital citizenship. Honey, that is what we are going through right now. Unfortunately for seventh graders, bless their hearts, they may be the seniors of the school, but they have hormones and they are still trying to figure out if they want to be adults, be preteens, be teenagers or do they want to still stay in the elementary area. You know they are still dealing with so many factors and plus on top of that, they are having to learn their academics. Now we have thrown digital citizenship at them. You know

> what, that is like a nightmare. Especially when you have a set of parents that don't have a clue about technology. The big thing about technology that I have noticed and I have recommended this to anybody who says something, we have got to teach our parents. I don't know how to do it. I don't know how to get them into the building.

The teachers felt that the administrative team took on the role of leader of ethics in technology by encouraging teachers to approach the topics of digital citizenship.

HR Harriet

Principal Organa and her administrative team spoke descriptively of how she took on the role of HR Harriet and made important hiring decisions before the initiative began. The majority of the teachers interviewed didn't recognize Organa taking on this role, but because Mr. Dameron worked more closely with Principal Organa, he vividly described her efforts in the role of HR Harriet. When describing the most important things Organa did to lead, support and influence the initiative, he commented, "She just finds the right people for the right job at the right time." When I asked him, "What do you think are the most important things a school principal should do when leading an initiative?" Dameron answered, "If you hire the right people they are going to take off running with it." He went on to explain the specifics of the type of people Organa hired in preparation for the one-to-one initiative:

> She hasn't hired stagnant people. She has hired people who, yeah it's not going to be easy to make this transition, but they're going to do it and they're going to go gung ho. And it's amazing how she picks that out of the crowd, out of stacks of applications.

He then reflected on how the eleven new teachers have done so far in the first semester of the initiative:

> These are new teachers this year. All of those teachers have come in and picked the ball up and taken it. When it would've been easy to say, 'You know what, this is my first year here, yeah I don't want to look bad, but I really just need to get my feet wet.' But they didn't do that, they jumped in. She hires the right people.

While the other teachers didn't comment on Organa and this particular role, Mr. Dameron was pretty adamant about Organa's role of "HR Harriet" and the influence it had on the initiative. This was more of a behind the scenes role that was harder for teachers to acknowledge, but Dameron, Organa and the administrative team were quick to detail the importance of this role.

Summary of the Analysis of Research Question Two

This section analyzed the study's qualitative data through the lens of the second research question:

2. How do teachers perceive the principal's efforts to lead, support, and influence the teaching staff in the implementation of a one-to-one initiative?

Teachers had a difficult time separating the ideas of leading, influencing and supporting, so these three ideas were analyzed collectively during the analysis of question two. In question two qualitative data was analyzed from four individual teacher interviews, two technology support interviews at two separate times of the semester. The teacher interview participants had a variety of teaching experience and they all had different levels of technology proficiency. Teacher interview responses were examined and discussed to determine teachers' perceptions of Principal Organa's leadership efforts during the implementation of the one-to-one initiative. Teacher responses were coded and sorted into the same thirteen a priori themes that were detailed in question one: visionary, digital expert, manager of resources, model of technology use,

technology supporter, leader or organizational, structural and policy change, leader of change in pedagogy and learning, leader of cultural change, evaluator of technology, encourager and supporter, family and community engager, leader of ethics in technology and HR Harriet. The top cited roles that teachers perceived Principal Organa took on were model of technology use, encourager and supporter and visionary. These were the exact same top three that were identified by Organa and her administrative team, although the major roles they identified were in different order. The similarities between the responses of the administrative team for research question one and the responses from teachers for research question two helped solidify the validity of the roles that Principal Organa played during the initiative.

Summary of Case 1: Naboo Intermediate School

This within case analysis of Naboo Intermediate School provided a rich and descriptive account of the principal's leadership, support and influence of the one-to-one initiative through the lens of the research questions and the role identity theory. The qualitative data were discussed through the roles that principals take on while leading instructional technology, which were outlined in the literature review of the study. These roles identified were: visionary, digital expert, manager of resources, model of technology use, technology supporter, leader of organizational, structural and policy change, leader of change in pedagogy and learning, leader of cultural change, evaluator of technology, encourager and supporter, family and community engager, and leader of ethics in technology. HR Harriet was the only additional role that emerged in the analysis of the qualitative data. The roles outlined in the literature review accurately described the principals and teachers perceptions of the leadership, support and

influence of the implementation of the one-to-one initiative. The details of how exactly the principals took on these roles was shared in this within case analysis.

Principal Organa took on every role during the initiative in some way, although her role as visionary was referenced more than any other role she took on during the initiative. Her vision for the initiative played an integral part in helping lead, support and influence the implementation. Her role of model of technology use was discussed almost as much as her role of visionary. Organa modeled every chance she had an opportunity to during the initiative and her modeling of OneNote at the very first staff meeting heavily influenced the staff's use of the program in their classrooms in the future. The third most referenced role Organa embodied was the role of encourager and supporter. By taking on this role, Organa helped teachers to feel a great amount of encouragement and support during the initiative.

The teachers perceived Organa and her administrative team's leadership efforts during the implementation of the one-to-one initiative in a similar way that the administrative team did. The teachers felt that Principal Organa took on the same top three roles that Organa and the administration perceived. The only difference was that the teachers referenced Organa's top three roles in a different order. They felt that Organa first and foremost took on the role of model technology user. After that they felt Organa took on the role of encourager and supporter and visionary. The within case analysis of Naboo Intermediate School not only discussed what roles Principal Organa took on during the initiative, but the analysis also detailed the specifics of how she played these roles during the initiative. The chapter gave Naboo Intermediate School's account of how to lead, support and influence the implementation of a one-to-one initiative.

Case 2: Endor Intermediate School

A backdrop of mountains greets visitors as they enter Endor Intermediate School. Teachers greet students as they are dropped off and make their way into the school building. Upon entering the building there is an office to the left and a waiting area in the middle of the hall. Most students make their way to the cafeteria to eat breakfast where many students have their computers and iPads out already. Once the bell rings, students walk to class in large groups as the school principal, Principal Windu, and a few adults monitor the students walking in the hall. Principal Windu begins the school day by reading the morning announcements over the intercom and by giving a warm greeting to students. Endor appears to be a typical elementary school at first glance, but upon closer look it is evident that the Endor staff have put in a lot of work to build their strong reputation.

Endor Intermediate School is a school of 754 students that originally opened in 2000. For the first twelve years of Endor's existence, the school served all fifth and sixth graders in the Lake District. According to the Endor Intermediate School website, in 2010, "the district began investigating the possibility of building an additional school and/or reorganizing the grades of its existing schools. The intermediate program became the centerpiece of the school system's comprehensive grade reconfiguration plan to be implemented in 2012." Because of the decision to reorganize schools, a new intermediate school, Naboo Intermediate School, was built to serve half of the district's fourth, fifth, sixth and seventh grade students and Endor Intermediate School was reconfigured to serve the other half of the Lake District's fourth, fifth, sixth and seventh grade students. Once the school was reopened the district appointed a new principal, Principal Windu. He inherited one assistant principal, Assistant Principal Ackbar, and was able to hire

another new assistant principal, Assistant Principal Rey. Like many other schools in the district, the school serves a predominantly white student base and has 87.0% white students and is a fairly affluent school. The school also serves a student population that is 4.9% Black or African American, 3.5% Hispanic or Latino, 4.1% Asian and 0.5% Native American/Alaskan or other as detailed in Table 1. Endor has a student population of 3.1% English language learners, 18.2% economically disadvantaged students and 12.8% students with disabilities. The school's population of economically disadvantaged students is 1.2 percentage points lower than the district percentage and 2.9 percentage points lower than Naboo Intermediate School. The school's economically disadvantaged student population is significantly lower in comparison to the state's economically disadvantaged student percentage of 35.1 %.

Endor Intermediate School is a departmentalized school, which means teachers in fifth, sixth and seventh grade all teach one subject area to multiple classes during the day. Most fifth, sixth and seventh grade teachers either teach language arts, math, social studies or science and their schedule is more reminiscent of a typical middle school schedule where students switch teachers and classes for every subject. The fourth grade teachers teach two subject areas to multiple classes and the teachers either teach language arts and social studies or math and science. Students follow a six period day where they attend all four core subject classes of language arts, math, social studies and science along with an Encore class and an enrichment or intervention class. Students are grouped into their language arts, math, social studies and science classes based on their ability level in each subject. The ability-grouped classes consist of level one, level two, level three and level four classes.

Endor Intermediate School's philosophy is outlined in the Endor handbook which is available to staff, students, and parents:

> The philosophy of Endor Intermediate School is that each student is a valuable member of our team. Our expectations are the result of a concerted effort to understand the developmental characteristics of the students we serve and an acknowledgment that all students can be successful. With this in mind our students and staff function with a set of expectations that lead from effort to success. In between are a set of commitments that define how we co-exist, treat one another, and fly like E.A.G.L.E.S.

The school's mission is "Creating challenging and meaningful learning experiences for every student while building strong, positive relationships." The school's vision is:

> The Endor Intermediate School Vision is a simple statement of the type of school we wish to see. In some aspects it is a reflection of what we have already achieved; in others it is a statement of how we would like to develop Endor. Overall, it is the common aim for everything we do from preparing lessons, to working with the children, to recruiting new staff, to improving our facilities. At Endor Intermediate School we:
>
> -**V**ow to engage the whole child
>
> -**I**mplement a program of excellence and celebrate our achievements
>
> -**S**et our sights on the future to prepare our students
>
> -**I**nspire our faculty, staff and students to build strong relationships
>
> -**O**pen our doors to create a safe and welcoming environment
>
> -**N**urture intrinsic learning in every child.

The school motto is "Where Effort Leads to Success" and the school expectations are effort, accept responsibility, give respect, let go and move on, exhibit honesty and success. The school motto and school expectations were found in various places throughout the school.

School Supports

Endor Intermediate School established a variety of structures to help support the staff and students as they maneuvered through the implementation of the one-to-one initiative. Some of these supports were established long before the idea of the one-to-one initiative was ever conceived, but they are important to describe because their existence impacted the leadership of the one-to-one initiative. The school supports described range from school meetings, to technology help supports and school based professional development.

Endor Intermediate School held various meetings during the initiative that helped support the one-to-one implementation including staff meetings, leadership team meetings and professional learning communities (PLCs). Many of these meetings were a part of the leadership structure of the school and the meeting participants made decisions and provided direction for the school as outlined in Appendix F. Endor's staff meetings convened monthly around various topics and always designated five to ten minutes to allow teachers to share about technology tools or resources they were using in their classroom. Endor's leadership team meetings met monthly and joined teacher leaders from various grade levels and subjects to discuss leadership topics of their choosing. The leadership team meetings gave the principal an opportunity to listen closely to the input from the team and the meeting agendas frequently included technology topics. Endor hosted monthly department PLCs that were led by a PLC leader and an administrator was assigned to each PLC. The PLCs focused on instruction and assessment, but

conversations about technology naturally occurred and the PLCs provided a powerful platform for teachers to share about how they were using their one-to-one technology in their classrooms.

Before the initiative began, Principal Windu spent a lot of time thinking of how to best provide technology support for the teachers of Endor Intermediate School. Principal Windu relied upon ongoing discussions with Endor's Early Adopters to formulate seven layers of technology support for the teachers of Endor (see Appendix G). The various supports either provided technical support when teachers or students were having technical problems with their devices or supports that helped teachers more effectively utilize one-to-one devices in their classrooms. These seven layers of support were: Endor Reinforcement, Help Desk, Building Level Technology Coordinator, FreshDesk Ticketing System, Early Adopters, Digital Conversion Support Team, and Building Level "Experts". All seven layers of support were established during the initiative, as Principal Windu said, "to build a culture where everyone shares and everyone supports." These supports were an important piece of Principal Windu's leadership of the one-to-one initiative and will be discussed in detail later in the study.

Whether it was "just-in-time" professional development, traditional professional development sessions, or the identification of professional development needs, Principal Windu and the technology coordinator worked hard to ensure that they were providing teachers with quality professional development during the one-to-one initiative. To meet the fluctuating needs of teachers during the initiative, Principal Windu and the technology coordinator developed a flexible and responsive type of professional development that they called "just-in-time" professional development. Two of the ways that Principal Windu and Technology Coordinator Amidala tried to create a "just-in-time" professional development system was through

instructional support meetings and open classroom observations. Instructional support meetings were meetings that the technology coordinator held with each team in the building every nine weeks where Early Adopters or teachers from different grade levels and the technology coordinator shared a technology resource they were using in their classroom. Open classroom observations provided teachers with an opportunity to observe other teachers in the school using various technology programs and resources with students in their classroom. Even though various "just-in-time" professional development methods were utilized during the initiative, traditional after school professional development sessions were still offered throughout the initiative. The technology coordinator utilized surveys and PLC conversations to determine the traditional professional development topics.

Endor Intermediate School

The qualitative data of the study included the observation of the principal, teachers and staff in staff meetings, administration meetings, professional learning communities, professional development sessions and classrooms. In addition to these observations, interviews were a crucial part of the Endor Intermediate School case study. The participants included Principal Windu, Assistant Principal Ackbar and Assistant Principal Rey, who were interviewed three times over the course of the semester. The principals were interviewed at the beginning, middle, and end of the semester. Technology Coordinator Amidala was interviewed two times during the semester, once at the beginning and once at the end of the semester. Four teachers from a variety of grade levels, subjects, and technology proficiency levels were interviewed at the end of the semester.

Technology Coordinator Amidala's background will be discussed in the assistant principal background section and her responses will be included in the analysis of research question one. The reason her responses will be analyzed and discussed with the principal's and assistant principals' responses rather than with the teachers' responses is because Amidala was seen as a part of the administrative team by the principal, assistant principal, and teachers. Assistant Principal Rey in one interview said, "She really has an administrator role. We kind of include her." During the analysis of the qualitative data, Amidala's roles in the initiative had more similarities with the assistant principals than with the teachers. The next section outlines the background of each member of the administrative team to detail how their backgrounds influenced the leadership of the one-to-one initiative.

Background of the Principal and Assistant Principals

Principal Windu was the head principal of Endor Intermediate School. He graduated and received all of his K-12 education from a school district near to the Lake District. Windu attended a large university in Tennessee and earned his Bachelor's degree in Business Administration and Marketing. Upon graduation, Windu worked in various department store management positions and later decided to become a teacher and attended a local private university to earn his Master's degree and receive his K-8 teaching license.

After he graduated with his Master's degree, Windu accepted a position at the Lake District Middle School as a seventh grade math and science teacher. In his second year of teaching, the principal moved him to a unique position where he would fill in for the technology teacher, teaching technology to sixth, seventh and eighth graders. Windu later sought out a teaching position at the new intermediate school when it opened and was hired as a sixth grade

science teacher at Endor Intermediate School. Windu worked in that position for four and a half years, leaving the teaching position mid-year to return to Lake District Middle School as the technology coordinator, where he spent five and a half years. At the end of the 2009-2010 school year, the principal at Endor Intermediate School retired and Windu was hired as principal of Endor Intermediate School directly from his technology coordinator position. In his first two years as the principal of Endor Intermediate School, the school served all the fifth and sixth graders of the district. In the 2012-2013 school year, the district added Naboo Intermediate School and reconfigured the grade structure of the intermediate schools to include grades four, five, six and seven. At the time of this study, Principal Windu was in his sixth year as principal of Endor Intermediate School.

The administrative team at Endor Intermediate School consisted of Assistant Principal Ackbar, Assistant Principal Rey and technology coordinator Rey. Assistant Principal Ackbar grew up in the Lake District and graduated from Lake District High School. Ackbar attended a college in Florida and earned his Bachelor's Degree in Physical Education. Ackbar accepted his first teaching job in 1989 at Lake District as a physical education teacher at Lake District Junior High, coaching basketball, tennis, football and track. Ackbar earned his Masters degree and Educational Specialist (Ed.S.) degree. Ackbar spent 12 years as the physical education teacher at Lake District Junior High and in 2000 accepted the assistant principal position at Endor Intermediate School. Assistant Principal Ackbar was serving in his sixteenth year as assistant principal at Endor Intermediate School when I interviewed him for the study.

Assistant Principal Rey began her career after college in the business world and worked in various marketing and sales positions before she decided to get her Masters degree in

teaching. Rey earned a K-8 teaching certificate and focused on reading and language arts also earning highly qualified status in math and science, in addition to reading and language arts. Rey accepted her first job in 2004 as a "floater" teacher who taught almost every subject at Lake District Middle School, when it was a seventh and eighth grade school. The following year, Rey was moved into an eighth grade science teaching position, then seventh grade science and eventually to seventh grade math. Rey highlighted that she was one of the first teachers to pilot Promethean boards, Activ Slates and Activ Votes at the middle school. Because of her experience with technology, the school board asked her to give presentations at other schools on the technology items she had piloted. Rey spent eight years as a classroom teacher before she took the assistant principal position at Endor Intermediate School in 2011. The 2015-2016 school year was Assistant Principal Rey's sixth year as an assistant principal at Endor Intermediate School.

Technology Coordinator Amidala grew up in a school district that was very close in proximity to the Lake District and graduated from a large public university in Tennessee. Amidala earned her Bachelor's degree in Zoology, but she also earned her elementary teaching certification. Amidala began her teaching career at Lake District Middle School and Amidala was kind of the "cart teacher," meaning she moved from classroom to classroom, for the first two years of her career. During this time, Amidala taught a variety of subjects and grades because of her elementary certification. In her third year as a teacher, Amidala settled into a more permanent position as an eighth grade science teacher. Amidala had no interest in leaving the middle school, but in 2000 when Endor Intermediate School was opened, Amidala was recruited to go to the new school to start the science labs and to teach sixth grade science. Amidala taught

sixth grade science at Endor for five years and then was asked by the principal to take on the technology coordinator position. Amidala served in the technology coordinator position at Endor for five years and then moved into what Amidala called a "pseudo-admin-ish-position." In this position Amidala was still the technology coordinator, but Amidala took on some more traditional assistant principal duties as well. At the time of this study Amidala was in her fifth year serving in this "hybrid" technology coordinator/assistant principal role. During this study, Principal Windu pushed hard to shift Amidala's role to more of an instructional support role and less of a technical support role.

Analysis of Research Question One A and B

This section examines the study's qualitative data through the lens of the first research question:

1. How do principals lead teachers in the implementation of a one-to-one initiative?
    a. How do principals support teachers in the implementation of a one-to-one initiative?
    b. How do principals influence teachers' use of technology in the implementation of a one-to-one initiative?

Interview participants at Endor Intermediate School had a hard time separating the ideas of leading, supporting and influencing. In an interview Assistant Principal Rey commented, "It's so hard to use them in isolation because they kind of mesh together" in reference to the terms leading, supporting and influencing. Participants sometimes separated these three ideas, but they commonly grouped the three ideas together when answering interview questions. Because of the participants' difficulty in separating these three ideas, research question one and the two subparts

were analyzed together. In the following section, I will explain whether a response was limited to leading, supporting or influencing or if the three categories were combined. In this section, qualitative data will be analyzed from a variety of sources to answer the question, "How do principals lead, support and influence teachers in the implementation of a one-to-one initiative?" The data analyzed in this section were collected from interviews, observations, principal shadowing, documents and archival records. When discussing research question one, three Principal Windu interviews, three Assistant Principal Ackbar interviews, three Assistant Principal Rey interviews and two technology coordinator interviews were analyzed for a total of 11 interviews. The principal and assistant principals were asked a variety of questions in their interviews and in one question they were given a list of twelve a priori roles and were asked to share which of these roles described how their principal led the initiative. For every role an interview participant shared, they were asked to describe the details or provide an example of the principal taking on that role during the initiative. The list of twelve research-based roles were drawn from the literature review in chapter two, and were provided to elicit more detailed responses from the interview participants of how the principal led, influenced and supported teachers in the implementation of the one-to-one initiative. Observational notes from staff meetings, leadership meetings, PLCs, professional development sessions and classrooms were analyzed, along with the documents and archival records collected from the school.

When analyzing these qualitative data sources, codes were created from the lens of the first research question and the theoretical framework of the study. These codes were sorted into the following twelve a priori themes that were identified in the literature review: visionary, digital expert, manager of resources, model of technology use, technology supporter, leader of

organizational, structural and policy change, leader of change in pedagogy and learning, leader of cultural change, evaluator of technology, encourager and supporter, family and community engager and leader of ethics in technology. The only additional theme identified was HR Harry because the codes related to human resources responsibilities that did not align with the other twelve a priori themes. The rankings of Principal Windu's and the administrative teams' perceptions of the roles Principal Windu took on while leading, influencing and supporting the one-to-one initiative can be found in Table 7. The rankings are based on the coding totals for each role during the data analysis. No teacher interviews were analyzed when answering research question one. Teacher interviews will be discussed in the analysis of research question two.

Table 7

Rankings of the Administrators' Perceptions of Principal Windu's Roles

Role Ranking	**Principal Windu**
#1	Visionary
#2	Leader of Change in Pedagogy & Learning
#3	Leader of Cultural Change
#4	Leader of Organizational, Structural & Policy Change
#5	Encourager and Supporter
#6	Family and Community Engager
#7	Manager of Resources
#8	Evaluator of Technology
#9	Technology Supporter
#10	Digital Expert
#11	Leader of Ethics in Technology
#12	Model of Technology Use
#13	HR Harry

Note. Rankings are based on coding frequency totals for each role during data analysis.

Visionary

Dexter summarized the implications of her 2011 study by saying, "Perhaps the central implication of these results for technology leaders is the importance of being cognizant of the power of a technology vision and expressing that vision in a coherent fashion" (p. 185). Principal Windu's role of visionary appeared in the analysis of the qualitative data more than any other role in the study. Throughout the study, Principal Windu's vision was illustrated in various ways. Technology Coordinator Amidala shared in an interview, "visionary, I think that that is a good word to describe Principal Windu, but I think he does it in a very behind-the-scenes way."

Principal Windu's overall vision for the school was expressed specifically through the Vision and Beliefs section of the staff, student and parent handbook. According to Assistant Principal Rey, Principal Windu and the leadership team formulated the vision and mission when Endor Intermediate School was reorganized in 2012. An important page of the handbook that outlined the Endor mission, beliefs, vision and personal and team expectations can be found in Appendix I. While the written vision didn't specifically cite technology or the one-to-one initiative in any way, the phrase "Set our sights on the future to prepare our students," was included, which indirectly related to using technology to help prepare students for the future. The handbook also detailed Principal Windu's and the school's focus and vision for each subject. Every major subject had a technology portion of their focus and vision for their subject. While the school's vision statement was detailed in the handbook and on the website, Principal Windu didn't think that the vision was more than a list of beliefs that he and the school had:

> It's not a living, breathing thing for us. If you ask, now I think if you talk to people, the things that are in a vision are things that we believe, but it's not for me to be able to sit here and regurgitate it to you.

When I asked the administrative team if the vision had changed at all because of the one-to-one initiative, both assistant principals Rey and Akbar didn't think the one-to-one initiative affected the vision. Ackbar commented, "Our vision has stayed the same, no doubt" and Rey shared, "I don't know that technology itself necessarily changes your mission and vision."

While the written vision did not change due to the initiative, Principal Windu and the administrative team felt like he communicated multiple technology visions in many ways throughout the initiative. Some of the consistent messages he communicated to the staff were inspired by his Mooresville district visit and the Early Adopters first year one-to-one experience. Principal Windu was among a group of administrators that had the opportunity to visit the Mooresville district in North Carolina. Mooresville was a highly publicized district that through the adoption of a one-to-one initiative closed achievement gaps and increased graduation rates (Schwarz, 2012). In visiting a district that was largely successful in implementing a one-to-one initiative, Principal Windu was able to formulate his vision for Endor Intermediate School's initiative. When I asked Principal Windu a follow up question about whether Mooresville was where he began to develop his vision for the school, he replied, "Yeah, when I came back, one of the first things I did was ask to be on the committees that were driving this." The Early Adopters and their first year experiences also heavily influenced Principal Windu's vision for the initiative. At the end of the first semester of implementation Principal Windu reflected, "I think that Early Adopter year and those meetings that we had ongoing throughout the year to help us

prepare for this … gave me the time I needed to find my voice and to find my philosophy." He mentioned that the Early Adopter year helped him say, "Okay, here's how we are going to step into this and here's how we are going to sell it and here's how we are going to support it and here's what we're going to do when this happens." Principal Windu was very clear in saying that without the Mooresville visit and the Early Adopter year, he didn't think the school would have been as successful.

A phrase that came up repeatedly when speaking with Principal Windu during the initiative was "moral imperative." Principal Windu described possibly first hearing the phrase from the Mooresville district:

> Mooresville does a really good job of this and I think they call it this. And if not this, this is what they should call it. The 'moral imperative.' What is the 'moral imperative' for doing this? Why are you doing it? It can't be because you want every kid to have a computer. It has to be something more than a device.

Windu went on to explain that Mooresville's moral imperative was about improving academics. The district had poor standardized test scores before the initiative and their "moral imperative" was to improve test scores, close achievement gaps, and increase graduation rates. Assistant Principal Rey also mentioned hearing the phrase "moral imperative" from Superintendent Kenobi, "I think the purpose of this initiative was clearly communicated. Our superintendent, Mr. Kenobi, used the words 'it's a moral imperative.' We owe it to our children to give them exposure to these devices." The phrase was also mentioned in the Endor handbook under the description of the one-to-one initiative:

> The one-to-one initiative is a district-wide initiative in the Lake District Schools to harness 21st century technologies that engage students, shift instructional practices, and create greater opportunities for learning – from kindergarten to graduation. In addition to professional development, digital citizenship training, and activities that support learning for college and career readiness, the one-to-one initiative offers every student an iPad or laptop for use at home and at school. Providing equitable access elevates the learning potential for every child – making this initiative not only a goal, but a moral imperative.

Regardless of where the phrase came from, it was a phrase that became a part of Principal Windu's and Endor's technology vision.

The "moral imperative" for the Lake District was very different than Mooresville because the Lake District already had very high test scores. Some of the "moral imperatives" mentioned by Principal Windu and the administrative team for the Endor Intermediate School one-to-one initiative were preparing students to be college and career ready, preparing students to compete globally and adopting one-to-one devices because it is the right thing for kids. Principal Windu described the long-term focus of the one-to-one initiative:

> It's always framed around, 'what is our job?' Our job just can't be to prepare a kid for seventh grade. If you're a sixth-grade teacher you can't just be preparing a kid for seventh grade. I think that that's the first answer to any question, 'What will you do in sixth grade?' We teach the standards to help them prepare for seventh grade. But this idea of college and career ending this in the more global perspective begs the question of what are you doing to help these kids to be more successful after they transition beyond Lake District schools?

This long-term focus meant that Principal Windu and Endor were looking to the future and students' lives after students left the Lake District. "However you describe our district, our moral imperative is, are we truly preparing kids to be college and career ready when our technology stuff is not even being used anymore," said Principal Windu.

Principal Windu and Assistant Principal Ackbar also talked about the moral imperative of having students be able to compete not just locally, but globally. Principal Windu described the changing job market that his students were going to face:

> To do more than just prepare them for a state test that happens in February and April. For them to be not just college and career ready, but able to compete. I talked to a class here recently about the fact that you all aren't going to compete like I did with other local high school graduates. You are competing with Tennessee and the nation and the world. Your world is a whole lot bigger than mine was when I got out. I was actually talking to a senior transition class, and one of the things we talked about was how to compete, because their job market is going to be very different than the one that I had.

Technology Coordinator Amidala and Assistant Principal Ackbar touched on the administrative team's moral imperative of adopting one-to-one devices because it's what is right for kids. Technology Coordinator Amidala explained Lake District's powerful position of adopting a one-to-one initiative not because they needed to increase test scores, but for other reasons:

> We didn't say we need to do this because we need better test scores or we need to do this because we need to raise our graduation rates. We're good. So we have to really think about then why are we doing this? Why are we bringing in one-to-one devices if it is not

> to improve this, this, and this? So philosophically, I think teachers were able to buy into the fact that we have to do this because it's the right thing to do for our kids.

Assistant Principal Ackbar, who believed teaching could be just as strong without technology, proclaimed at the end of the first semester of the initiative that technology is the right thing for kids. Ackbar shared, "I probably feel more after one semester of it, that it is the right thing. Now it's not the cure-all. It's not magic, but it's the right thing and it's very manageable." While Endor's moral imperative didn't focus on improving struggling schools like Mooresville, all three moral imperatives communicated centered around something bigger than test scores and were all an important part of Principal Windu's vision for the one-to-one initiative.

In a school as large as Endor, there were, obviously, teachers who were comfortable with technology and some who were not. Technology Coordinator Amidala shared:

> One great thing about how our district has rolled this out and, specifically, how Principal Windu addresses this issue in our building, is that we don't expect everybody to be in the same place with technology integration. We just expect everyone to be moving.

Principal Windu was very clear with teachers and staff throughout the initiative about communicating the vision that it is ok wherever staff members are with technology, but everyone needs to move forward with technology from where they are. I repeatedly heard the phrase during the initiative, "start where you are and move forward." Assistant Principal Rey shared that Principal Windu and the administrative team tried to communicate, "The biggest thing we've tried to push is we want you to be where you are with technology. We don't want you to be here. We want you to start where you are and just grow." The technology coordinator mentioned hearing this same message repeatedly during the initiative, "His constant communication and

very frequent communication of being where you are and moving forward. I can't tell you how many times we heard that in a variety of ways from him." Windu even re-communicated this message in every staff meeting according to Technology Coordinator Amidala, "Just about every faculty meeting when we share new technology. He always says remember it is not where you are now, but where you're going kind of idea." Principal Windu's vision of "start where you are and move forward," was received well by the staff. Principal Windu shared a survey that was given to the staff by Technology Coordinator Amidala at the end of the semester, "A lot of the feedback and a lot of the focus that we're getting from the staff is, 'thank you for honoring my process, thank you for letting me take baby steps'."

When it came to Principal Windu's specific vision for the one-to-one initiative, much of his vision was derived from his exposure to the Technological Pedagogical Content Knowledge (TPaCK) model. This model helps to frame the various components of successfully implementing technology in the classroom and it had a powerful impact on Principal Windu's vision of how to use technology during the initiative. The one-to-one initiative director, Mrs. Jinn, first introduced Principal Windu to the TPaCK model. Principal Windu recalled his thoughts when he was first exposed to this model, "It just seemed to fit what we were trying to do and we had talked about some of the same things, but TPaCK packaged it. It gave words and meaning and structure to what we were trying to do." The TPaCK model was so influential that it shaped Windu's vision and particularly what he communicated at the beginning of the first year of the initiative. Assistant Principal Rey reflected, "Principal Windu kind of set up the stage a lot kind of talking about that TPaCK model." Principal Windu shared his thoughts on the

TPaCK model and that it was a big part of what helped him identify how he was going to sell the initiative to his staff:

> It took me getting to the TPaCK model before I think I really internalized what this was supposed to look like. I think it took me last year and that was those district level committees and instructional resources and deployment team meetings that I was on at the district level and those helped me internalize and wrap my head around, 'This is how I'm going to sell this to the staff.'

The TPaCK model continued to be a big influencer of Principal Windu's vision throughout the initiative. Ultimately, Principal Windu reflected that, "the TPaCK model helped me frame the conversation about not letting the technology change our classroom."

The technology visions that were communicated consistently by Principal Windu were, "it's not about the technology", "technology is a tool", and "don't let technology takeover the classroom." Constantly throughout the initiative I heard the phrase, "it's not about the technology" from administrators and teachers alike. Principal Windu, very early on in the study, made it clear to me that "it was not about the technology":

> I don't know what you are going to experience when you're here, but what I hope what you see in the building is not the technology, but the instruction and how technology can support it. These questions about the focus of technology, that's not our focus. That's not our focus with the one-to-one initiative. It's neat to see how technology is supporting instruction.

The team truly believed and communicated the vision that even though the school was implementing a one-to-one initiative, technology was not needed for great instruction. Principal Windu shared:

> Great instruction was going on in classrooms before technology showed up. I have level 5 (highest level rating a teacher can receive) teachers in my building that don't have any access to technology. They don't need anything more than a whiteboard, a book, and their relationship with their kids to get them to grow and learn. That's all they need.

Even after finishing a semester of the initiative Assistant Principal Rey believed, "I told you my theory is 'a good lesson is a good lesson.' It doesn't matter if you are using technology, great, but if you're not using technology, you could still have a good lesson." This belief didn't mean that the potential impact of technology was minimized, but rather that the school's focus remained on instruction and assessment throughout the initiative. Principal Windu was very clear about his vision and his approach that focused on instruction and assessment:

> I keep going back to, I'm not communicating about technology this year, I'm seeing it, I'm lifting it up and I'm honoring it when they are doing it well and I'm trying to reinforce that. But I'm focused on assessment and instruction this year and making sure we are teaching the hound out of those standards because that's the only thing we know to do right. And then we'll have to do an autopsy at the end of the year and see how we did. All of my initiative, all of my resources are in and around instruction and assessment and those kinds of things related to TN ready and TN Core. When technology can help that, we will layer that in, but honest to God, if I went into this year focused on the device, the instruction and the assessment wouldn't have been there. I think that would've been

> wrong, personally. I didn't think that that was the right approach. I wouldn't do any of that any different. I'm very comfortable with where my focus is with this faculty.

Windu reiterated in his final interview, “We’re not just looking at the technology, we’re also looking at instruction, we’re also looking at assessment. We’re looking at all aspects of what we do.”

Principal Windu and the administrative team’s vision was so focused on instruction and assessment instead of technology that they even communicated to teachers to not use technology just to use technology. Early on in the initiative Assistant Principal Ackbar communicated to me:

> The worst thing in the world a teacher can do when they get their laptops is to teach a lesson just because they can use the computer. They have to teach their content. If they can use it to help them do that, then fine.

Principal Windu consistently communicated this same idea of not just using technology for the sake of using technology throughout the initiative. Assistant Principal Ackbar even used a football analogy to describe a good teacher using technology just to use technology, “It's sort of like running a trick play when you really don't need it. We are running it down the field on this team and now let's run a double reverse pass. Well why? How come?” Principal Windu even went as far as telling teachers to “put the technology up” if they were trying to use technology and it was negatively affecting their instruction:

> I preach it. When a teacher looks at me and says, ‘I’m two weeks behind on my scope and sequence because of the technology,’ then the question for me is why haven't you put the technology up? The technology is affecting your instruction and your ability to

> progress with these kids. Why is it still out? We can't let that be a setback and I learned that last year from those Early Adopters. So this year going into the year, if the technology is in your way, you better put it up.

This communication to teachers was powerful and when I asked Principal Windu to reflect on the best things he has done throughout the in initiative, not making the initiative about the technology was one that stood out:

> I think we have done a good job of not making it about the device. Even though the device has been a big part of classrooms, when you go out in the building, I don't talk about and we don't highlight. I don't think we have been over focused on it. I really, really, don't. I think we have lived up to the balance of good instruction.

The vision from Principal Windu of "it's not about the technology" seemed to permeate the building and be a meaningful part of the technology vision for the school.

While Windu's vision remained centered on instruction and assessment during the initiative, Windu and the administration regularly communicated that technology was a tool or resource to help with instruction. Assistant principal Ackbar commented in an interview, "As far as them teaching the nuts and bolts of what they are wanting them to learn, it just falls in there as another tool." Assistant principal Rey said, "I think you got to remember that it is a tool and a resource, but it can't replace everything." Time after time, the administration and the staff referenced technology as a tool during the initiative. There were even a few analogies shared by Assistant Principal Ackbar that referenced the vision of the one-to-one devices being used as a tool. In one interview he referenced them to a pencil, "If I'm observing a class and they have out their laptops, it's no different than when they have out their pencils. You know what I mean? It's

just a tool it's just part of it." Assistant principal Rey expressed that in reality the one-to-one devices were an important tool that they were fortunate to have, but they were no more important than the instruction:

> It's neat when you hear one-to-one initiative! Everybody has a device and we are on our computers all the time, but that's not really what it's about. It's a resource and is a valuable resource and our students are very fortunate to have them but it's like with anything else, you have really good instructional techniques and strategies, and getting students to group together and have conversations is just as important.

By expressing that technology was a tool, the administration kept the focus on instruction.

Principal Windu also added onto his vision and communication of "it's not about the technology", and technology is a tool by reiterating throughout the semester that teachers should not let the technology takeover their classroom. Windu shared mid-semester, "I don't want the technology to take over the classroom; I want it to support." Windu explained that this vision stemmed from experiences during the Early Adopter year at Endor. Many teachers became too focused on the technology and Windu felt that it negatively impacted their instruction at times. Principal Windu recalled the lessons learned from the Early Adopter year:

> I remember having some one-on-one conversations with teachers about how the technology had taken over their class. We had to step back from that. I remember asking some teachers, 'What do you feel like you do well in the classroom? Name your philosophical approach. How do you like to teach?' And once we named that, one of the follow-up questions was, 'Then why are you letting the technology take you away from that? Why are you letting it replace what you do?' And they were like, 'I thought I was

> supposed to'. And I was like, 'Nobody told you that. Nobody said let the technology takeover.'

Because of these experiences, Windu made it a point to communicate this to teachers:

> I feel like stepping into this year we got really focused on, and this was in response to the Early Adopter feedback and hearing and understanding what they went through. We spent a lot of time with them throughout the year venting and reflecting and that has all shaped the mindset that I brought into this year and that mindset has truly just been, here is this piece of technology, do not let it take over your classroom because it did for some Early Adopters.

Principal Windu felt that because technology didn't take over the classrooms during the first semester of the initiative was why they were successful:

> I think we are having a successful implementation right now because I don't for the majority, I don't think that the technology has taken over. I think it is being utilized in many different ways. I think there have been some epic successes and major failures in classes. I think the majority of the teachers in here could probably talk to you about something that just really went well with technology and something that didn't go like they wanted it to. But last year I felt like I heard more, 'I feel like I'm teaching technology in my class. My scope and sequence is all messed up. I'm three weeks behind this year of where I was last year and it's all because of these computers.' We are not hearing that this year.

This communication of not letting the technology take over aligned with the other two communications of "it's not about the technology" and "technology is a tool" to formulate Principal Windu's vision for Endor Intermediate School.

Windu shared the importance of not only communicating these visions, but ensuring that a principal is consistent when communicating these messages. Consistency in communicating the vision was a theme that arose in multiple interviews with Principal Windu. Windu spoke of the importance of a principal following up the communication of their vision with actions:

> I think what's important from a leadership perspective is knowing your message, knowing what's important, whether it's about the device or not and then being consistent. They will pick up on, 'do what I say not what I do' and vice versa. And this faculty is that good. If my message didn't line up with my actions, as we make this change, then they would call me out on that. My job is to be consistent and for them to see the consistency, for them to see that we stepped into this year and it wasn't about the device and if I see the device out all the time, that's wrong and if I see the device out none of the time, that's wrong. Somewhere in the middle is where we are supposed to be living and I'll honor that with everyone.

Principal Windu consistently communicated a vision for the school during the first semester of the initiative and the role of visionary was a role he seemed to embody the most. This role was coded more than any other role and it epitomized the type of leader he was during the initiative. By taking on the role of visionary Principal Windu was able to set a consistent and clear vision, which allowed him more time to take on other roles throughout the initiative.

Digital Expert

Principal Windu took on the role of digital expert in a few ways during the initiative. Principal Windu brought a technological background into his position as head principal as he spent five and a half years as a technology coordinator at Lake District Junior High. Because of this technical background, Assistant Principal Ackbar believed, "It's been a real natural thing for him to take the lead in our building." At the end of the study, Ackbar reflected on the advantage of Windu having this background:

> We are fortunate that Principal Windu is pretty savvy in the whole integrating, I hate to use the term technology, it's such a broad term, but he is very comfortable using electronic tools in his world and he was a tech coordinator before he became principal and that's a valuable piece. He knows the nuts and bolts behind it and he knows what the equipment is capable of.

Others on the administrative team referenced Windu's background as a technology coordinator and how it made him feel comfortable taking on the role of digital expert. When speaking about the role of digital expert, Windu shared his comfort with the role:

> That's an area of comfort for me because of my background. My job was to be a technology specialist. So when I get an opportunity in this job to step back into that role I love it. It's very comfortable for me.

Principal Windu expressed that it is important for him to take on the role of digital expert at times because he needs to support teachers:

> If you don't go on Blackboard and create something and be able to see who's viewed it, who hasn't viewed it and be able to understand the nuts and bolts and what a teacher has to do when they're not going to do that and then I can't lead that or support it.

I did witness and hear of Principal Windu showing his digital expertise a couple of different times during the semester. He utilized a program called Moviemaker for a parent night, recorded a presentation using a Swivl device so he could put the video on the website, and he used the program OneNote to create a staff digital notebook at the beginning of the semester. Teachers were able to go to Principal Windu when they had questions on the OneNote program because he had experience setting up a notebook and using it.

While Principal Windu had every intention of being a digital expert when the initiative began, the fast pace at which teachers were learning and utilizing new software and programs during the initiative made it increasingly difficult for him to take on the role of digital expert. As the semester progressed, Windu said things like, "I am struggling to keep up" and "there is no way to keep up with it" and "there are so many different resources now, the number has multiplied in one semester exponentially." So what was once a natural role for him, was becoming less and less comfortable for him because he had been out of the classroom so long:

> When you step out of it, time and distance creates that 'I don't know what I don't know anymore.' Unfortunately, because there's so much going on in this building, I can't even wrap my head around all the different ways teachers are utilizing the technology.

The rapid proliferation of technology resources made Windu feel like he was behind at times. "I feel like I'm getting further behind," shared Principal Windu. Windu continued, "I feel less proficient than the teachers. And there was a time where I probably wasn't and I think it's

because their progress accelerated this year when the computers came into the classroom full time." Windu shared in one of his interviews that the feeling of being behind and struggling to keep up at times with technology programs made him feel like a "digital dummy" at times.

Ultimately, this feeling of being behind and struggling to keep up forced Windu to rely on others more often to take on the role of digital expert. Assistant Principal Rey spoke for the administrative team in regard to the role of digital expert, "I don't think we ever really feel like we have to be the experts on everything." A big reason for this was because of the technology support systems that were in place at Endor. Rey shared, "it's not that we don't have to be, it's just I feel like our efforts, I feel like the way we're set up with the support system in place, I feel like our efforts need to be somewhere else." Rey also felt that it helped that the school believed in and promoted teacher leaders. Even though Principal Windu liked being the digital expert in the past when he was a technology coordinator, one semester in the initiative helped him come to the realization that he didn't need to be the digital expert:

> I think jack-of-all-trades, master of none. You feel a little bit like that in this position. I mean I have four grade levels, four content areas per grade level in the core. I have 16 sets of standards and that doesn't count all the stuff outside of it. I need to know a little bit about everything, but I'm not going to be an expert. I need to be an expert on pedagogy because pedagogy is good no matter where you are at. I need to be able to talk assessment and I need to be able to talk instruction. If I can do that and layer in the other stuff, then I think that that's what I need to be successful.

This quote reiterates that Windu focused more on instruction and pedagogy during the initiative and less on being the digital expert. Windu's previous experience as a digital expert when he

was technology coordinator seemed to be helpful in the leadership of the initiative, but it appeared that as the initiative went on, Windu had to rely more and more on the digital experts around him to lead, support and influence the one-to-one initiative.

Manager of Resources

Even though the district made many of the technology spending decisions during the implementation of the one-to-one initiative, Windu still had to play the role of manager of resources at various times throughout the semester. Windu had to make many important technology spending decisions by advocating for outside groups to do additional technology resource spending, spending school funding on hardware, software and school conferences and reorganizing positions to allow for technology focused spending.

Manager of resources was a role that Principal Windu mentioned as being one of his most comfortable roles to take on because of his past as a technology coordinator. Technology coordinator Amidala felt that manager of resources was an important role for Principal Windu:

> That manager of resources is big for him because we have a finite amount of resources for teachers. They find something, 'Oh I want to try this', he has a finite amount of resources to do that with. He encourages teachers to be selective and to be deliberate about that process in choosing what they want to purchase and what they want to use in their classrooms, I think he's really good at that.

Principal Windu expressed that he had to play the role of manager of resources when teachers asked for technology resources and he had to make the decision of whether or not to spend school money on the requested resources. Technology Coordinator Amidala shared the

importance of his response when a teacher went to him requesting to buy a technology program or subscription:

> You have a teacher that's a hesitant user of technology and they found this website and here's what it costs to subscribe to it and he has to balance that with that finite amount of resources, without squelching the teachers' enthusiasm for trying something new.

If he wasn't able to spend school money on certain requested technology resources he had to advocate for his school:

> When I think about managing the one-to-one initiative, what I feel like I manage is advocating for my school and my teachers to make sure they have what they need. That's making sure I give the one-to-one-initiative director, Mrs. Jinn, feedback, the superintendent feedback, and that I listen to my teachers and hear where they are at and hear what they need. What questions they have when I go to the parent organization and ask for money in order for them to support something.

Principal Windu shared that advocating for the parent organization to spend money on technology resources, particularly software subscription licenses, was difficult at times because it was different than the items the parent organizations had traditionally spent money on. He shared about this challenge when I sat down with him at the end of the semester:

> Parents in those organizations like to be associated with those flashy, big, you know the Lake District schools provide the basics for the students and we do the above and beyond. That has always been their philosophy. So they don't want to fund stuff that is recurring. They don't want to fund stuff that doesn't have a plan in place that continues beyond their support and those kinds of things. One of the conversations that we've had with the parent

organization as we stepped into this year is, we're going to question that. We need to be able to come to you and say every year, we need $2000 for 20 license of Nearpod because I have 20 teachers that are wearing it out. Can you help out with that?

Principal Windu was referring to his decision to go before the parent organization and request that they purchase twenty Nearpod Pro licenses for various teachers at Endor. Nearpod was an interactive presentation and assessment tool that gained massive popularity over the course of the semester at Endor. Being an advocate for the teachers and making sure they had what they needed resource wise was a very important role for Principal Windu because Endor had a limited amount of school resources to spend on technology.

I was able to obtain many budget related items from Endor Intermediate School, which allowed for a detailed analysis of their spending. The bookkeeper detailed in a "Purchasing Procedures 2015-2016" document that teacher funds came from two sources: ADA funds and General Funds / Fee Money. The ADA Instructional Supply Funds were supply funds from the district that were allocated to the principal and the principal would then make a decision on what percentage of the funds to allocate to teachers. The General Funds / Fee Funds were monies collected internally at the school from things like student fees and field trips. Endor collected a $50 student fee from every student and Principal Windu allocated $8 or 16% of the student fees to technology. Principal Windu also had to submit his Endor principal budget requests to superintendent Kenobi for the 2015-2016 school year on March 15, 2016. The document shown in Appendix J outlines Endor's 2015-2016 budget requests. Each of these categories had items related to technology that the school requested. During the school year, Technology Coordinator Amidala could approve lower cost software requests. For more expensive requests, teachers

could approach Amidala, but often had to go through Principal Windu for approval. Technology Coordinator Amidala discussed the approval process in her first interview:

> We actually have a set protocol that we push out, but they come to me first and it's pretty much approved at the building level and if they want to try something on their teacher device, they can download it, try it or do whatever. When it comes to purchasing, then Principal Windu gets involved.

The technology purchases that Principal Windu made in his role as manager of resources were in the areas of technology hardware, software and conferences. In the Instructional Materials and Supplies category, the only hardware purchase made at the school level was the purchase of a new Promethean board (see Appendix J). On the other hand, Principal Windu allotted a majority of his budget to the purchase of software. Windu requested the Accelerated Math software subscription and a request for an iPad application fund for the teachers in fourth grade was also detailed (see Appendix J). Principal Windu spoke about this decision to request an iPad application in his first interview:

> One of the things I've done this year, you'll see within my budget proposal that I turned in last school year, when I realized we were going to iPads, every teacher in fourth grade got a budget for apps. I didn't give money to every other teacher in this building.

Windu also approved a large amount of spending on the Study Island software subscription for every grade level. Windu purchased the software subscription in the subjects of reading, math, science and social studies for the fourth and fifth grade. He also purchased the software subscription for sixth grade in the subjects of reading, science and social studies and for the seventh grade team in the subjects of science and social studies. In my classroom observations,

teachers in all grade levels used the Study Island software regularly. The Training & Staff Development category detailed that Windu requested some of the budget funds to be used for Digital Conversion Conferences and training for iPad and laptop users (see Appendix J). Technology Coordinator Amidala stated that Principal Windu planned to use the money outlined to take interested Endor teachers to the Future of Education Technology Conference (FETC), a technology conference in Florida . In talking with Principal Windu, it was clear that he found value in sending teachers to technology conferences. Not only did he request money for conferences in the 2015-2016 school year, but he also sent nine teachers to the 2015 International Society for Technology in Education (ISTE) summer conference. As the "Other" category outlines (see Appendix J), Windu requested stipends for the Digital Conversion Team he formed at the school. Windu also documented that he worked with teachers to write grants for additional funding for technology during the first semester of the initiative. All of these funds that were requested and spent were part of Principal Windu's role as manager of resources during the one-to-one initiative.

In addition to spending money on technology hardware, software and conferences, Principal Windu played the role of manager of resources in the way that he reorganized spending on personnel and positions at Endor. Assistant Principal Ackbar shared at the end of the semester, "Resources, we have repurposed a lot of areas in our building for this initiative." As appendix J outlined in the Instructional Materials & Supplies category, Principal Windu ended a contract the school had with an outside technology company and eliminated a special education teaching assistant position and another technology teaching position to help establish a Help Desk at Endor. This reorganization of spending allowed Windu to hire a technology teaching

assistant and other technology related teaching assistants and put money towards the physical setup of the new Help Desk.

The manager of resources role was referenced less than other roles during the initiative, but it was still an important role that Windu played throughout the initiative. In fact, when Windu was asked what the key to the success of this initiative was in the future, one of the things he shared was, "getting a real grasp of our budget and how we're going to implement resources." Principal Windu knew that as teachers became more comfortable with the one-to-one devices many technology resources requests would follow and he would have to take on the role of manager of resources to decide where Endor Intermediate School would put their financial resources in the future.

Model of Technology Use

Principal Windu modeled technology at different times throughout the semester, but it wasn't a major role he played based on the interviews, observations and the responses of Windu and the administrative team. He did, however, feel very comfortable with the role and it was one of four roles with which he felt most comfortable. In fact, he often grouped these four roles together as he shared in an interview, "I would lump Digital Experts, Model Technology Users and Managers of Resources and maybe even Technology Support together." Even though model of technology use wasn't a major role for Windu, he still believed that it was important for him to live by example as much as he could. Assistant Principal Ackbar explained that Windu did this by never asking teachers to do more than he was able to do:

> Principal Windu is very good at modeling. He's not going to ask teachers to do more than he's willing to do and so, he is very comfortable taking on, I guess, technology, as you

> want to use it. He models that in our team leader meetings and he utilizes the things that he has asked the teachers to do with our students, he does that with our staff.

Ackbar went on to share that Principal Windu took on the role of model of technology use by always modeling something different for teachers in staff meetings:

> Anytime we have big staff or faculty meetings, he is always utilizing some strategy using his laptop. So he is showing teachers that may not be so ready, to do that. So every meeting we have done he has come with something different.

Staff meetings were one of the biggest ways that Principal Windu modeled technology for teachers. In the year before the initiative began, Principal Windu actually flipped a faculty meeting. The term "flipped" comes from the idea of flipping a classroom. Flipping a classroom generally means that a teacher puts a video form of their lesson on the Internet. Students are asked to watch the video and then come to class with any questions they have about the lesson. The teacher then uses the class time to allow students to collaboratively or independently work on the skill that was taught and the teacher is available if the students have any problems or questions. This is different from the traditional model where students receive their instruction in class and generally do their work in class or sometimes at home. Windu flipped a faculty meeting by putting a narrated video presentation on the school's newly adopted learning management system, Blackboard, and had the teachers watch it at home. Principal Windu described this experience:

> You talk about modeling technology use. One of the things we did last year was I flipped faculty meetings. So we were Blackboard for the first year and everybody was using Blackboard. I tried to create some Blackboard faculty meetings that flipped some

> information that had some accountability to it and instead of meeting as a faculty meeting we had a virtual faculty meeting.

Principal Windu explained why he chose to do this the previous year when they were adopting a learning management system in preparation for implementation of the one-to-one initiative, "I had teachers flipping their classrooms, so I wanted to live it and see what that looks like. He explained that it was important for him to try what the teachers were trying. Principal Windu took on the role of model of technology use by creating a OneNote digital notebook for staff. Technology Coordinator Amidala explained:

> One of the things he has done this year, and I think this could be influence or lead, is he's tried to go digital for our team leader meetings. Where as we used to pass out papers, and I know that seems like a minor thing to do, but we're using One Note notebooks and sharing them with our teachers, so there's that technical piece of teachers being able to download and open access these files that he's sending out. It's done in a very casual, celebratory way. Like when we first went to that first meeting and everybody had the notes that they needed and everybody went yeah! I think that they see in that moment that he's right there where they are, trying to add technology infusion to what he's doing and that can be huge.

He would put the meeting agendas on the digital notebook before the meetings and someone would take notes in the interactive notebook during the meetings. Teachers could access this digital notebook at any time to see past meeting agendas or notes. Assistant Principal Rey also recalled a time where she and Principal Windu demonstrated a program called Splashtop in a staff meeting. It was a program that allowed the user to control the computer screen from their

iPad or phone and teachers could control the screen from the back of the classroom so they could watch what students were accessing on their computers.

Principal Windu also took on the role of model of technology use in a parent night. He created a voice narrated presentation using the program Moviemaker, which modeled the use of the program for teachers and parents. Assistant Principal Rey talked about why she and Principal Windu modeled technology during the parent night, "we are trying to model by how we present and use information in front of the parents, so that they can get a feel for these are the items that the teachers are using."

Principal Windu took on the role of model technology use during the initiative, but it wasn't a major role. He mentioned that he thought he did a better job in the role of model of technology use the year before the initiative began:

> Model technology user, I feel like I did a better job of that last year. Although I continue to try to do it. Though it has proliferated out so much in my building I can't model everything that a teacher is doing. There is no way to keep up with it.

Principal Windu seemed to personally struggle a little bit with the pace that technology was changing in his building. He was excited with what the proliferation of technology in his building meant for Endor, but a bit of his identity seemed to change because he had been a technology coordinator and digital expert for so long. This change of identity meant that he took on the role of model of technology use less and he took on other leadership roles more during the initiative.

Technology Supporter

Principal Windu grouped the role of technology supporter with the roles digital expert, manager of resources and model technology user. While he still played a role as technology supporter, he supported this role more by taking on other roles and by building structures to ensure that teachers were being supported throughout the initiative.

One of the key pieces in Principal Windu taking on the role of technology supporter and establishing structures and procedures occurred before the initiative began. At the end of the Early Adopter year, Windu sat down in a meeting with Technology Coordinator Amidala and all of the Early Adopters. This was an important luncheon where Principal Windu and Technology Coordinator Amidala simply listened to feedback from the Early Adopters and learned from their experiences (see Appendix H). As the agenda details, the layers of support and many other logistical items originated from this meeting. This agenda was evidence that Principal Windu was a technology supporter before the initiative began.

The seven layers of support were important technology support structures that were put in place by Principal Windu, Technology Coordinator Amidala and the Early Adopters before the initiative took place (Appendix G). Principal Windu stated, "We put some structures in place hoping that if we create layers of support, then one thing will resonate with a particular person. And if they don't get what they need, they can go to their Early Adopter." Principal Windu and Technology Coordinator Amidala also highly encouraged students and teachers to do some of their own technology troubleshooting before visiting the Help Desk. The layers of support and the preliminary troubleshooting recommendations helped support teachers with any technology

problems they had and these items drastically reduced the amount of technical support that Principal Windu and the administrative team had to provide.

Even though Windu's layers of support limited his time in the technology supporter role, he commented that this role was one he had to take on the most in the first nine weeks of school. In his first interview Windu detailed:

> One of my biggest jobs right now is to be a liaison and advocate and I have to work really closely with Technology Coordinator Amidala on this. You want to be supporting teachers instructionally, but if this technology is not working, forget instruction.

Keeping the technology working and the sheer logistics of the implementation of the initiative were a big focus at the beginning of the semester. Principal Windu repeatedly mentioned the focus on logistics in his first interview. He said, "That's the kind of stuff we are doing. It's logistics right now" and "logistics are important." A big reason that logistics was the focus at the beginning of the semester was because of the unknown of whether or not there would be problems with 800 devices all accessing the network at the same time. As the semester went on, teachers utilized the layers of support, but Assistant Principal Rey believed that teachers still felt comfortable going to Principal Windu, Technology Coordinator Amidala or her for technology support. While the teachers sometimes went to the administration for technology support, Principal Windu noted that he continued to feel less and less comfortable providing teachers with technology support:

> There are so many different resources now. The number has multiplied in one semester exponentially. I am using One Note, so there are teachers out there that are using it and I can help you with that, but if you're using Nearpod or Showbie or Socrative? Blackboard

> rocks my world. I try to play around with it. I've done a little bit with that, but there is so much that a teacher can pick and choose in their one or two areas. But if every teacher chooses one or two pieces of software or resources, well just within the core that is 60+ resources potentially. So I feel that disconnect a little bit.

This massive increase of technology software and resources used made Principal Windu feel less proficient than ever before with technology. He mentioned that he felt "less proficient than teachers" and "To sit here and say I feel less proficient sounds like I've gone backwards."

Endor did run into one big technical problem during the initiative where Principal Windu didn't necessarily take on the role of technology supporter, but he advocated for technology support from the district. The district made a last minute decision before the initiative began that meant the fourth grade at both intermediate schools would adopt iPads instead of laptops like the elementary schools in the district. Because the iPads were being taken home during the initiative, the district had to purchase filtering software to ensure that the students wouldn't access any inappropriate content or sites when they were away from school. The filtering software caused multiple problems with the iPads and teachers were unable to access some very important programs and sites that they needed for their instruction. The problems continued and at times worsened throughout the semester and Principal Windu had to advocate for his school and sometimes be the "squeaky wheel" as he called it:

> Amidala and I are constantly dancing on making sure the teachers feel supported, and that their level of frustration doesn't get too high, but also knowing that we're in an implementation curve and there are going to be bumps along the way, so how much of a squeaky wheel am I going to be back up to the district and say, 'You need to get to my

building and fix some stuff. My teachers have reached our limit. Somebody's got to show up.'

Principal Windu went on to explain that the district was very supportive of this iPad issue. It appeared that being the advocate and the person who established technology support structures were far more important than him providing direct support to teachers.

Whether it was the technology support structures that Windu put in place or the district's efforts, Endor's administrative team shared that there were few technology issues and the transition was overall "very smooth." The iPad software issue was really the only major technical issue that the school dealt with. Principal Windu thought that getting some of the minor technical issues "settled a little bit better" was a goal for the future of the initiative, but overall, he did not have to take on the role of technology supporter very often because of the structures and supports that he helped create before the initiative began.

Leader of Organizational, Structural and Policy Change

The role of leader of organizational, structural and policy change was an important role that Principal Windu took on mostly before the initiative began. While many of the structural changes Windu made affected his role as manager of resources and technology supporter, most of the changes he made stemmed from his role as leader of organizational, structural and policy change. When Principal Windu was asked about leading the initiative he spoke about the importance of putting in place structures, "When I manage the one-to-one initiative, it's managing that piece of it and continuing to make sure that the structures you put in place are still being utilized and are working." In the role of leader of organizational, structural and policy change, Windu established structures, made personnel changes and created policies and

procedures to help lead, support and influence the implementation of the school's one-to-one initiative.

Principal Windu, Technology Coordinator Amidala established multiple structures before the initiative began. One of the biggest support structures he established was the Endor layers of support. These were the seven layers of technology support that were established to provide teachers and students with technical support and teachers with instructional support throughout the initiative (see Appendix G). The seven layers of support were: 1) Endor Reinforcement 2) Help Desk 3) Building Level Technology Coordinator 4) FreshDesk Ticketing System 5) Early Adopters 6) Digital Conversion Support Team 7) Building Level "Experts". The Endor Reinforcement first layer of support was made up of "student workers in each homeroom class who had training on minimal device support/troubleshooting skills". The Endor Reinforcement students were put in place to help support teachers and students in each classroom with any technical problems that arose. The Help Desk was a crucial structure that he established to help provide teachers with a place to go to for technical help if their technical problems couldn't be solved by the Endor Reinforcement or other layers of support. The Help Desk was run by the technology teaching assistant until 12:30 pm everyday and Technology Coordinator Amidala would assist students or teachers with any technical problems that occurred after 12:30. The third layer of support was the building level Technology Coordinator Amidala and as the layers of support document described "she primarily focused on the intersection of technology with pedagogy and content" and she was "available to assist with creating lessons, co-teaching, and resource identification and management." The second half of her role focused on providing technical support to teachers as she was "available for technical support and as a liaison to

district level support for ticket referral". The fourth layer of support that Windu established was a FreshDesk Ticketing System where teachers or students could submit emails to the Help Desk when they were having technical problems that the other layers of support couldn't solve. Teachers and students could submit these "tickets" outside of the Help Desk hours and the technology teaching assistant or Technology Coordinator Amidala would come to the classroom at some point to help with their issue. The fifth layer of support that Principal Windu created was the Early Adopter mentor program, which assigned every Endor teacher to an Early Adopter teacher, who had already had the one-to-one devices in their classrooms the previous year. The Early Adopter mentors helped support teachers with any instructional and device questions they had. The sixth layer of support was the Digital Conversion Team. The Digital Conversion team was established by Windu to be the "Logistical and basic technical support and instructional support including identification of resources and ideas for creating overlap between pedagogy and content with technology." The team had representatives from every grade level and department at the school. While Principal Windu admittedly didn't use the team as much as he had originally planned during the first semester, he mentioned that he had big future plans to utilize the team as the one-to-one initiative continued. The final layer of support that Windu established was the Digital Experts and it was simply a list of teachers at Endor and their areas of technology expertise. This list was created by Principal Windu to help teachers have another person to go to in technical areas where they had questions. All seven layers of support were created to support teachers while they were implementing the one-to-one devices in their classrooms.

Principal Windu made many personnel changes before the one-to-one initiative began to support the initiative. Whether it was shifting Technology Coordinator Amidala's role, eliminating the technology teaching position, or eliminating a contract and a special education teaching assistant position to supply a teaching assistant to run the Help Desk, these changes were made by Windu to help support the initiative. When I asked Technology Coordinator Amidala about the roles that Principal Windu played during the initiative she answered, "So I think the first one that pops up is the leader of organizational change because I think that was directly related to me and how he gets information out and shifts my role." Principal Windu made a specific decision to shift Amidala's role to "an instructional support person." Amidala had generally been a technology troubleshooter in the past and Windu felt that she had more to offer to teachers when it came to instruction:

> You have to know what their strengths and weaknesses are. If I had taken Technology Coordinator Amidala and tried to make her a technician, that would've been an epic fail. So we were not going to do that. I was going to paint a different picture for Technology Coordinator Amidala in the implementation of this.

Principal Windu felt that Amidala's strengths would be better utilized in the initiative if she "primarily focused on the intersection of technology with pedagogy and content" as the layers of support document outlined (see appendix G).

Principal Windu eliminated a technology teaching position to support the initiative. With the money saved he purchased teaching assistant positions to teach the technology class and a teaching assistant to help with intervention classes. Principal commented on what may seem to some as peculiar change:

> You wouldn't think that you lose a technology teacher in a one-on-one initiative, but we are shifting the focus of what goes on in technology because we know a lot of that really has just been pushed back on the classroom because the technology is there.

Windu also shared another reason why he made the decision to eliminate the technology teacher position, "I could have had a technology teacher this year, but the superintendent had already let me know that going into the following year I wouldn't have the technology teacher position." Windu was going to have to cut the position the following year and he felt that by eliminating the position before the start of the initiative, he could shift the technology class to more of a keyboarding focus because the students would be taking the state's online test for the first time at the end of the first year of the initiative. As Windu put it, "We don't want keyboarding skills to get in the way of them being able to do anything." Even though he eliminated the technology teaching position, he utilized two teaching assistants to teach the technology class. Windu talked about the new technology class:

> We have a morning and afternoon TA and they do keyboarding skills. We beef up that keyboarding instruction starting in fourth grade and then we just use the technology period to kind of maintain those skills and hopefully they will continue to grow.

Principal Windu also decided to terminate a contract the school had with an outside technology support services and eliminate a special education teaching assistant position to help purchase a teaching assistant to help with the Help Desk. The teaching assistant Windu hired to work the Help Desk had a background working for IBM and filled the position extremely well. As Windu put it, the teaching assistant was "sent from heaven." All of these personnel roles helped shift

roles so that the teachers could be better supported during the implementation of the one-to-one initiative.

Finally, this role encompassed any policy changes that Principal Windu made during the initiative and Windu had to take on the role of leader of policy change several times before the initiative officially began. Two topics that were pertinent to the administrative staff at Endor were ensuring that students remembered to bring their devices to school and ensuring that students brought their devices to school fully charged. Because of these two concerns, the administrative team at Endor created a "Device Left At Home Policy and Procedures" document and a "Device Not Charged Policy and Procedures" document. The documents were sent home to parents when students did not follow the school technology guidelines and detailed the consequences for when students left their devices at home or brought their devices to school not charged.

Even though Endor was adopting a one-to-one initiative and was device friendly, Principal Windu kept a fairly strict cell phone policy in place. He allowed students to have their cell phones out until 7:40 am and at this time they were asked to be put away. They were allowed to be out again at 2:40 when the school day ended. Principal Windu mentioned that the student council approached him during the initiative to see if he could change the cell phone policy to allow for cell phone use at lunch. Principal Windu said that he denied their request because he didn't want a "bunch of plugged in kids that don't know how to interact with each other." Windu added, "We want our students at lunch interacting with each other and not with the device. That's our job is to help support a well-rounded student."

One of the important technology procedures that was created before the initiative ever began was the Endor "Super Six" (see Appendices K and L). Principal Windu described the "Super Six" in our first interview together:

> The super six are the agreements that we have put in place about how we will help with logistical stuff for the kids on how their devices will travel and be utilized in our building. For example the first one is, move between classes and move between home and school only with the device zipped in its sleeve and across body.

Principal Windu, Amidala and the Early Adopter team created the super six procedures to ensure that student devices were protected and that their devices were ready to be used for class. When I asked Principal Windu where the idea of the "Super Six" came from he shared, "I think that really came out of Mooresville. There were a lot of things that they really hung their hat on procedurally that I wanted to make sure we were doing when we came back into the building." While the initial idea came from his visit to the Mooresville district, he explained, "The Super Six was adopted and developed by our Early Adopters, those who lived it." Principal Windu shared that the "Super Six" were only adopted at Endor Intermediate School and none of the other Lake District schools. The "Super Six" document was distributed to the teachers at the beginning of the school year and many of the teachers posted the document in their rooms. Windu made some very important decisions when he took on the role of leader of organizational, structural and policy change, by creating structures, making personnel changes and establishing policies and procedures to help support Endor's one-to-one initiative.

Leader of Change of Pedagogy and Learning

The role of leader of change of pedagogy and learning centers on helping teachers use technology to enhance student outcomes and pedagogy. While Principal Windu valued this role as leader of change of pedagogy and learning during the first semester, he did not intentionally make helping his teachers use technology to enhance student outcomes and pedagogy his main priority. This was a role that he felt he would play more as Endor progressed further into the initiative. However, throughout the first semester he took on this role in a variety of ways. He acted as a TPaCK coach at times and provided teachers with helpful feedback, provided personnel and layers of support to help teachers use technology to enhance their instruction, he communicated clear technology and usage expectations, and helped connect teachers to enrich pedagogy and learning at Endor.

The idea of the role as leader of change of pedagogy and learning appealed to Principal Windu and his leadership efforts when I spoke with him, "the things that resonate there are leader of change of pedagogy and learning. That resonates with me because that's TPaCK and you know that that's more important to me than the technology piece." The TPaCK model had a profound impact on Principal Windu and his approach to the initiative because the model valued pedagogy and content knowledge equally as much as technology. Principal Windu was a leader who focused intently on instruction and assessment and ensuring that teachers provided good instruction. Assistant Principal Ackbar explained:

> Principal Windu's style, it is very important for him to support good instruction and I think he's got really good at discerning what good instruction needs to look like and how it looks different in every classroom. He does a really nice job of seeing what good

> instruction is and if it's going on, and being able to correct that if he feels like it's falling short. He doesn't have a problem calling them in and saying, 'This one was a little weak. Let's figure out why.' I think that's one of his biggest strong suits as a leader. His ability to really help teachers in the classroom.

This desire to support good instruction was what helped him take on the role of leader of change of pedagogy and learning in various ways throughout the initiative.

Part of taking on the role of leader of change of pedagogy and learning during the initiative was helping coach and provide feedback to teachers in their use of technology, pedagogy and content knowledge, which was essentially serving in a TPaCK coach role at times. Principal Windu mostly left the role of TPaCK coach to Technology Coordinator Amidala, as he focused much of his feedback to teachers on pedagogy rather than technology. As leader of change of pedagogy and learning, Principal Windu had to trust the layers of support he put in place to help teachers use technology to enhance student outcomes and pedagogy. Of the seven layers of support to help teachers throughout the initiative, three (Building Level Technology Coordinator, the Early Adopters and the Digital Conversion Support Team) aimed to help teachers instructionally and mentioned "pedagogy and content" in the description. .

By setting a clear vision and expectations of computer usage, Principal Windu indirectly helped teachers in their use of technology to enhance student learning and pedagogy. Messages and visions made it clear to teachers that technology was a part of what they were doing going forward, but it was not more important than pedagogy or content knowledge. Principal Windu was very clear in his communication to staff that there was no expectation of computer use

during the initiative. Technology coordinator Amidala gave her thoughts on Windu's expectation of computer use:

> He would never put out anything that said you need to be using a device this number of days, this amount of time a day. I think the closest he has come to that is to say, 'It is okay wherever you are starting as long as you're moving forward'. I don't think he expects when he walks into a classroom for the devices to be out all the time.

Principal Windu's philosophy was all about trusting his teachers throughout the initiative and he felt like this was the best approach to encourage and help teachers use technology to enhance student learning and pedagogy. Windu shared a favorite saying of his that related to his approach to not setting specific computer use expectations:

> There's a saying, policy gets put into place when trust isn't there. So you have things that you want people to do and if you don't trust that they're going to do it, then you make a policy. Right now, I feel like a policy or a technology plan for the majority of this building would be stifling because the goals that we would have set and the expectations that I would've had, the majority of this building has exceeded.

In fact Principal Windu and other administrative team members were quick to contend that Endor benefited from having few computer usage expectations. Assistant Principal Rey shared:

> I think the thing that I have been surprised by is, we don't force teachers to be in any specific place, but there are teachers right now where I'm very surprised where they are. They are further than where I expected.

Windu felt like this approach actually helped expand the realm of possibilities for the teachers:

> I don't personally think you roll out the one-to-one initiative and then say, okay here are the resources you are going to use. That may be easy way to do it, but I think that stifles growth. I think when you hand them the expectation, they'll live up to the expectation. When you say the sky's the limit and then you try to support them in that, then you have reached the sky in a lot of situations.

Principal Windu explained, "I think right now everybody is just trying to figure it out in year one and I truly believe that if I had to put an expectation on it then we wouldn't have gone as far as we have."

Another way that Principal Windu took on the role of leader of change of pedagogy and learning during the initiative was that he established ways for teachers to connect with other teachers so that they could learn from one another to better use technology to enhance student learning and pedagogy. Assistant Principal Rey and Principal Windu both described how exciting it was at times when teachers found technology resources that enhanced their instruction and were willing to share those resources with other teachers. Rey shared the teachers' excitement over technology resources, "You get those teachers in the building that are pretty pumped and excited and willing to share and it's contagious." Principal Windu felt that it was important during the initiative to find ways to connect teachers and share resources around the school so that everyone could learn from one another. Assistant Principal Rey discussed the importance of sharing resources, "Trying to figure out ways to get people to share resources has been huge. The collaboration of even when you share something in a course you get into a conversation with another teacher and you both grow." Windu helped create many things for the initiative to help connect teachers and to facilitate the sharing of resources so that teachers could

push each other's use of technology to enhance their instruction. He helped establish instructional support meetings, open classroom observations, offer Building Level "Experts" as a layer of support and allowed staff members to share their use of instructional technology during the staff meetings.

The instructional support meetings were an idea Technology Coordinator Amidala brought before the Early Adopters during the 2015 End of Year Early Adopter luncheon (see Appendix K). Principal Windu and the Early Adopters established the instructional support meetings as a "just-in-time" type of professional development that were held with all teams in the building every nine weeks. During the meetings Technology Coordinator Amidala, Early Adopters, and sometimes grade level teachers shared an app, website, or program that they thought might benefit the participating grade level team. Amidala then made herself available to the team in case they wanted help in integrating the technology tool in their classroom. These meetings connected teachers and gave teachers a platform to share how they were utilizing technology resources to enhance their instruction.

Open classroom observations were another form of "just-in-time" professional development created by Principal Windu and Technology Coordinator Amidala and were held anywhere from two to four times a month during the initiative. If a teacher was using a technology resource that they wanted to highlight or showcase, they sent an email to Technology Coordinator Amidala with the details of when and what resource they would be using in class. Amidala forwarded the email to the entire staff and anyone who wanted to attend could do so during the designated time. Assistant Principal Rey reflected on why these open classroom observations were so powerful:

> People are diving in and sending emails to Technology Coordinator Amidala and saying, 'I will be using this. It is the first time, it may not be great.' You've got teachers not only using it, but they've thought about how they are going to use it and they're inviting other teachers to come and see it and it's different than 'Let me show you this app or let me show you this program. Hey, come watch me instruct with this program and how I'm going to use it.' That to me is that valuable piece. I can show someone an app all day long and they don't know what to do with it, but we show how teachers are using it and they're actually going to show a lesson with it and how they embed it. That to me is big.

A great example of the effectiveness of these open observations was the Nearpod example. Assistant principal shared that the popularity of the Nearpod program started with a fourth grade teacher at Endor. The fourth grade teacher began using the Nearpod program, found it to be extremely useful and sent an email to Technology Coordinator Amidala sharing that anyone was welcome to come see him use the program from 2:30-3:00 with his class one day. Amidala sent the open classroom invitation email to the staff and some teachers went to the open classroom observation and witnessed the fourth grade teacher utilizing the program in class and were immediately drawn to the Nearpod program and began using the program themselves. The program proliferated throughout Endor and resulted in twenty Endor teachers requesting a paid subscription to the more advanced Nearpod Pro program. This technology program started in one classroom and the open classroom observation gave the program a platform to spread across the building and this ultimately impacted multiple teachers, students and enhanced student outcomes and pedagogy. Another important layer of support that helped Principal Windu connect teachers was the Building Level "Experts" (see Appendix G). This list of "experts"

documented who in the building were experts in each technology resource area and the list gave teachers another way to connect with other teachers and learn from one another.

Another way that Principal Windu allowed teachers to share and connect with one another to enhance their pedagogy and learning during the initiative was through the five to ten minute section of the staff meetings that he designated for various teachers to talk about technology. Windu created this time for teachers and mentioned that "Faculty meetings are another opportunity for us to share the good stuff that is going on in the building and things that other teachers are doing." Technology Coordinator Amidala described that "whenever we see a teacher latch onto something they love and they really start using it in their classrooms, they share out at faculty meetings for five or 10 minutes." This time of sharing during the staff meetings happened approximately once a month. Teachers discussed various resources over the semester and in one staff meeting a teacher presented about the digital notebook program called OneNote. Principal Windu commented on how powerful it was to witness the teacher talk about the OneNote program in the staff meeting:

> For him to stand up, this faculty knows this guy. We know each other. They have respect for him and I also know that he's not going to do something unless he sees value in it. So he immediately brings a lot of credibility, and the staff asks, 'Should I look at this?'

I observed another staff meeting where two teachers shared about the Swivl iPad camera program and how they used the technology tool to tape their lessons and reflect back on their teaching. This sharing section of the staff meeting was an opportunity for Principal Windu to highlight a technology program to the whole staff. Whether it was being a TPaCK coach, establishing a technology coordinator position, creating layers of support to help teachers,

communicating a clear technology vision and clear computer usage expectations or providing opportunities for teachers to connect and share, Principal Windu took on the role of leader of change of pedagogy and learning during the initiative to help teachers use technology to enhance student outcomes and pedagogy.

Leader of Cultural Change

Principal Windu demonstrated that he understood the influence culture has on a school through his comments, "The culture is always going to be important" and "My job is not to lead the one-to-one initiative. It is to create an atmosphere that supports a digital conversion." Assistant Principal Ackbar agreed that Windu valued the role as leader of cultural change, "Cultural change, that's very important to him and us. Not only culturally as far as people wanting to be in our building, but the whole culture of what it means to have a school system that is one-to-one." Throughout my time at Endor, Windu was always cognizant of the culture of the school.

During the initiative Principal Windu continued to facilitate a culture that helped drive and support the implementation of the one-to-one initiative. Windu created a culture where everyone was responsible for supporting the initiative, a culture that encouraged teacher growth throughout the initiative, that was fun, where teachers felt little to no pressure, embraced the TPaCK model and where everyone shared with one another. Windu wanted to create a culture where everyone contributed and helped one another. He shared:

> It's not what I know or what Technology Coordinator Amidala knows, it's what we all know and that's one of the things, that's part of the culture that we are trying to build with

> this. Technology isn't something that Technology Coordinator Amidala leads, it's something that we are all responsible for.

A great example of Windu creating a culture where everyone supported the initiative was the seven layers of support.

Principal Windu found it important to create a fun school atmosphere during the initiative. "We are all about the fun, teaching nowadays is really tough. We don't need to create any ways to make it more tough, so we like if we can find ways to make it more fun," explained Assistant Principal Rey. Principal Windu liked to create this fun atmosphere and he described the type of principal he wanted to be:

> I want to be the principal that can walk down the hall and joke with you, I also want to be the principal that I can call you and say, 'Hey we need to talk'. But they know that we can have fun together and we can laugh. My building can get irreverent sometimes. We like to have fun, but at the same time we're here to do a job. What's nice is I have fifty plus teachers in this building who every day come in and they hit it pretty hard.

Endor seemed to balance this sense of fun with hard work throughout the initiative. Assistant Principal Rey explained that the administrative team worked hard to "come up with things that were fun for teachers." Rey thought that it was helpful to try and add a fun factor with things to the point where the staff didn't "realize what they were doing while they were doing it because they were having fun doing it." A great example of Principal Windu and the team trying to add a sense of fun to things was when they created a bingo game for the staff during the initiative (see Appendix M). The bingo game was a way to encourage the staff to branch out and try some new things, all while learning and supporting the school in the process. Assistant Principal Rey

reflected on the bingo game, “what's been fun about the bingo game is it didn’t necessarily focus on technology, it's just focused on doing some fun things and sharing ideas, but technology has benefited.” The staff members earned prizes and “jean days” if they got five squares in a row or “blackout” on the bingo card. Principal Windu felt that the game added to the fun school culture and tapped into the competitive nature of the school:

> Bingo is competition and they love it. It is. It wasn't meant to be that, but that's how they internalized it. It’s a self-competition and it has a competitive nature and we sent out pictures and put bingo in the title and you have to look at pictures of what all the people in this building are doing.

The bingo game was just one small example of how Principal Windu tried to create an atmosphere of fun during the one-to-one initiative.

In addition to creating a fun atmosphere, Windu also sought to create a culture where there was little to no pressure. Throughout the initiative Principal Windu led in a low pressure type of way. In one of the field notes that I documented while shadowing Windu, I wrote that he had a “very low pressure style of leadership.” Time and time again during the initiative I heard repeatedly in interviews that Principal Windu didn’t put any pressure on the teachers to use technology. I heard comments like “he's pretty comfortable with technology, but he hasn't put that pressure on teachers” and “we have not put that added pressure on them.” When I talked to Assistant Principal Rey about why they took this no pressure approach she shared:

> I think that is why we kind of took the approach of, ‘Start where you are and move forward. Where you are is where we want you to be kind of deal,’ because you can

> completely change the attitude of someone trying to go through this initiative by having that forceful approach.

A lot of this approach simply came back to Principal Windu's philosophy as a leader. When addressing the school culture he shared, "I want it to be relaxed. I think people work better and are more effective when they don't feel like it is an 'I have to', but it is that I want to." Principal Windu described his "relaxed" philosophy:

> I think anybody works best when there's a level of comfort. You can't work in a pressure cooker all the time. Unfortunately, our state and our country of late have created a pressure cooker in education. My job is to figure out how to make it not feel like that or to laugh it off or to make them feel like we are in this all together.

When talking about the no pressure culture he likes to build, he made it clear that he never wanted the culture to become too comfortable. He reflected about a survey that the staff takes at the end of the school year to rate him as a school principal and he said that one question in particular was always very important to him:

> The question on the survey says 'Are you held to high standards of professionalism in your building?' My approval rating on that is usually anywhere from 95% to 98%. When that drops, I'll know that my efforts to create a relaxed, hard-working, professional environment have been replaced by we're a little too laid-back and were not as focused as we need to be.

Another reason that Windu tried to build a no pressure culture with the initiative was because of the lessons he had learned from the Early Adopters. The year before the one-to-one initiative began, 14 teachers at Endor were chosen to be Early Adopters. The Early Adopter year was a

successful year, but the Early Adopters felt immense pressure to use their devices regularly and to use them effectively. This pressure wasn't from the district or from Principal Windu, but rather the pressure was self-imposed. Assistant Principal Rey shared about this self-imposed pressure the Early Adopters felt:

> We kind of had to talk them off the ledge at times because they would hear that this teacher and this teacher were using this and this and this and they would think, 'I'm not using that and I need to do that.' So they were really stressing themselves out.

Rey shared that the Early Adopter year was a beneficial learning experience for Windu and the administrative team, "Going through the early experience has helped us this year to communicate 'don't do that' with the other staff and they can provide that feedback of don't try to keep up with everybody else." Even with learning from the Early Adopter year and Principal Windu putting little to no pressure on the staff, the staff still seemed to still put some self-imposed pressure on themselves throughout the initiative.

One example of how Principal Windu tried to create a culture of no pressure is when he made the decision to focus on very few things technology related during the first week when teachers came back to school. Endor teachers had gone to two days of summer one-to-one initiative professional development and many of the teachers also went to a state training, so the teachers had learned a lot of technology related information over the summer. For this reason Principal Windu made the decision to focus on few things technology related at the beginning of the year, "We did the stuff that we had to do for technology, because I didn't want to overwhelm them. I didn't want to be stepping into this going, 'Oh, my gosh, how are we going to do this?'"

Principal Windu continued with a no pressure approach to school culture during the initiative despite an outside consultant who suggested otherwise. During the initiative, an outside one-to-one instructional technology consultant visited Endor and was very complementary of the progress that Endor was making, but he did make one recommendation to Principal Windu and Technology Coordinator Amidala. Windu shared the recommendation, "The consultant gave the suggestion that each teacher should have an individualized technology plan. That's the best practice from a corporate perspective and from the consultant perspective." The consultant's reference to individualized technology plans meant plans to outline how each teacher would be growing in their use of the one-to-one devices in their classroom. While Principal Windu admitted that he and Amidala spent a long time discussing the recommendation, Windu didn't feel like individualized technology plans were appropriate for the staff during the first semester of the initiative. He felt that the plans would have put too much pressure on the staff and negatively affected the culture. Windu later reflected, "The culture is always going to be important and it goes back to I don't have an individualized technology plan for everyone in here. Right now I'm letting them grow at their own pace." Windu prioritized facilitating a culture of no pressure even when the consultant questioned him and he stuck to his philosophy that people work better when they are in an environment with less pressure.

The TPaCK model not only influenced Principal Windu's vision for the one-to-one initiative, but it also influenced the culture of Endor. Principal Windu talked to the staff at the beginning of the year about the TPaCK model. Some of the things he shared to influence the school culture were:

> Technology is a piece of good instruction, but so is good pedagogy and instruction. It's that TPaCK knowledge deal or content knowledge. Pedagogical and content, and it doesn't matter where you're at as long as you are moving and if you're not moving, we will have to have a conversation. Those are the things we try to say over and over and over again. That's the influence because right now I'm trying to influence the one-to-one initiative culture.

In a mid-semester interview with Windu, he shared that he felt like his constant communication regarding TPaCK was making an impact on the school's culture:

> I think I am starting to see a lot of evidence that our teachers are owning the culture of TPaCK. They are not going to go out and be able to name to you pedagogy, technological content, we're not using that language at all. That's a little too formal for us probably, but they're owning that, 'This is where I'm at and this is where I'm headed.' And as long as they're doing that, then I feel like I'm laying some foundational pieces and that's the most important thing to me right now.

The TPaCK model was an important piece of the culture he wanted to form because it placed equal value on technology, pedagogy and content knowledge.

During the initiative, Principal Windu sought to create a culture where teachers shared their knowledge with one another. In my first interview with Principal Windu he explained his desire to create a culture of sharing:

> What I have to do is this. I have to create a culture as much as I can where people are sharing what they are doing and looking for avenues to get that information out. If I do

that with the culture in this building, people will see it and then it becomes that "just-in-time" professional development.

Assistant Principal Rey felt like creating a culture of sharing was the administrative team's purpose, "I feel like our purpose is to get the teachers that are doing well with something to share with the others." This desire to create a culture of sharing drove Principal Windu to create various ideas and supports to help facilitate this type of culture. Some of the supports and ideas he created were the staff bingo game, instructional support meetings, open classroom observations, building level experts, a five to ten minute sharing time at staff meetings, an opportunity to share iPad applications at the nearby primary school and an opportunity to share with the other intermediate school in the district. Two of the squares on the staff bingo board were activities that required staff members to share technology ideas. One of the squares on the bingo card asked the bingo player to "send an email to Technology Coordinator Amidala inviting teachers to view a lesson in your class" and another square asked the bingo player to "share a technology resource with your grade level department at the other intermediate school." Assistant Rey reflected on the bingo game and how it helped reinforce a culture of sharing, "It was all about getting them to come forward with what they're doing and sharing it out. They initiated that. We reinforced it." The establishment of the instructional support meetings allowed for Early Adopters, other grade level teachers and technology coordinator to share ideas with grade level teams. The open classroom observations were another natural way for teachers to observe other teachers and learn great ideas of how they were specifically using technology in their classrooms. These open observations helped with the sharing of resources throughout the building and helped make Nearpod the most shared program around the building. The Building

Level Experts layer of support that was created by Principal Windu and Technology Coordinator Amidala gave the teachers experts to approach if they wanted to learn about a particular digital resource. The five to ten minute portion of staff meetings that was dedicated to teachers sharing about helpful technology resources gave staff members another opportunity to contribute and another opportunity to learn from one another. Principal Windu and Assistant Principal Rey also provided the Endor fourth grade team with an opportunity to attend an "Appy Hour" with the nearby primary school, which allowed for the sharing of helpful applications they were using on their classroom iPads. All of this facilitated a culture where teachers could learn from one another and share best practices in technology. At the end of the semester Principal Windu was proud to share, "we built a culture where everyone shares and everyone supports." Assistant Principal Rey reflected on the first semester of the initiative, "I think we are further than I thought we would be, mainly because people are so willing to share." The role of leader of cultural change was a crucial role for Principal Windu during the first semester of the one-to-one initiative and he aimed to create a culture where everyone helped support the initiative, a culture that encouraged teacher growth, a fun environment, a culture with no pressure, a culture of TPaCK and a culture where everyone shared and everyone supported.

Evaluator of Technology

Principal Windu felt uncomfortable with taking on the role of evaluator of technology during the initiative. Whether it was that he had few expectations for teachers and their use of technology or his laid back no pressure approach, he very rarely reported taking on the role of evaluator of technology during the initiative. Assistant Principal Rey admitted that the administrative team took on the role as evaluators of teachers, but was quick to dismiss

evaluating technology separately, “when I think of evaluating teachers we’re not looking specifically at technology as separate.” Principal Windu felt that evaluating technology separately would send the wrong message that it was all about technology. Essentially all that mattered to Windu was the end product, “I’m not going to evaluate what you're using or what you're not using, I'm going to evaluate the end product.”

Principal Windu reported that the administrative team conducted regular informal walkthroughs and formal teacher evaluations, but his walkthrough and evaluation feedback for teachers generally focused around content and pedagogy. Principal Windu sometimes provided teachers with technology feedback when conducting an evaluation if he thought the feedback would help the lesson:

> If I'm working individually with the teacher and then if I think owning or stepping into using a piece of technology better would help them, then I'm going to have a conversation. But if the results are where they need to be, I’m probably going to have a conversation first about content and pedagogy.

Like with many of the other roles, Windu’s focus remained on pedagogy and content knowledge. Principal Windu was comfortable if some teachers’ utilization of technology never surpassed the lowest level of substitution on the SAMR model as long as there was high quality instruction:

> There are teachers in this building in their utilization of technology, may never get past substitution. Right now, I'm okay with that. Now what I'm not okay with, is if it's at the substitution level and the instruction and the pedagogy aren’t at level five (highest evaluation score), aren’t at the highest order. It's okay for the technology to not be there

because it's a piece, but it can't be the other two. So I'm going to address that when I see that.

If technology was a piece of the instruction that helped the lesson, then Principal Windu was happy, but he never set out to take on the role of evaluator of technology during the initiative.

Encourager and Supporter

Although encourager and supporter was an important role for Principal Windu, the administrative team did not discuss the role as extensively as they did some of the other roles. In his first interview Windu said, "Encourager and supporter, I hope that I'm seen as that." Assistant Principal Rey felt that it was a role at which he was genuinely good, "He is also really good at encourager and supporter. Those are big for us. Just a big leadership piece of everything that has to change and keeping it in a positive direction." A couple times during the initiative Windu described himself as a servant leader and he thought that aligned with the role encourager and supporter, "Encourager and supporter, I feel like that is that servant leadership, which I think is how I would describe myself." Principal Windu recognized that new initiatives often had difficult periods or times when teachers' confidence dropped. In a mid-semester interview Assistant Principal Rey shared a conversation the administrative team had regarding being an encourager when times were tough, "I know we just had conversations about the team just getting out there and finding positives. Those 'That a girl!' especially when it's difficult for teachers."

There were many ways that Principal Windu played the role of encourager and supporter during the initiative. A key part of him playing this role was the vision he consistently communicated to the staff of "start where you are and move forward." This message encouraged

growth and encouraged teachers to push themselves as Assistant Principal Ackbar recalled, "he understands what the technology is capable of, so he is the encourager of our teachers to push themselves a little bit in that arena." Principal Windu also encouraged teachers to not compare their use of technology with other teachers during the initiative by saying, "just because this teacher over here is full-blown doing everything technology, that doesn't mean you have to be there." His vision and consistent messages during the initiative especially helped encourage experienced teachers who were sometimes not as proficient with technology. Ackbar said Windu's encouraging message was meaningful to experienced teachers throughout the initiative, "He is not one that makes these folks who have been in the business for a long time feel inadequate if they're not doing it or using it. He says use it to the best of your absolute ability." Principal Windu's main focus remained on pedagogy and content throughout the initiative, but he did admit that he would highlight and encourage good technology use if he saw it, "I'm not communicating about technology this year. I'm seeing it. I'm lifting it up. And I'm honoring it when they are doing it well and I'm trying to reinforce that. But I'm focused on assessment and instruction this year." Technology Coordinator Amidala also agreed that while Principal Windu's focus was not on technology during the initiative he would frequently encourage teachers if they were trying something new:

> I think I've got to give him the label of encourager and supporter, too. I think that he places a lot of value on celebrating teachers where they are and the small steps that they're making. To acknowledge that and to give them a pat on the back when they do something new.

Overall, Principal Windu found a variety of ways to encourage teachers throughout the initiative and took on the role of encourager to help lead, influence and support the initiative.

Windu also saw the importance of the supporting side of the encourager and supporter role during the initiative. Principal Windu noted that a principal's leadership "dances on making sure the teachers feel supported, and that their level of frustration doesn't get too high." When reflecting on Windu's role as encourager and supporter, Technology Coordinator Amidala shared, "I think encourager and supporter and when you see it written that way, it sounds very insignificant, I think, but I think he does do that and he makes sure that our teachers have the support that they need." There were many ways that Principal Windu supported teachers during the initiative. He was the reading and language arts PLC leader and thus supported the reading and language arts teachers during the initiative. Windu's presence in PLCs helped him to gauge whether teachers needed extra help during the initiative. Once during the semester Windu helped support a teacher who was struggling with her test scores and he actually supported her by going in and co-teaching with her. Principal Windu said this was a new practice for him, but something that Assistant Principal Rey did regularly that he wanted to try to support this struggling teacher. Principal Windu created the seven layers of support with Technology Coordinator Amidala to help provide teachers with technology support, but the layers helped teachers to feel an overall sense of support as well. Amidala and Windu also created the instructional support meetings and Windu felt that these meetings were a key support for teachers, "I keep lifting up that, those meetings that Technology Coordinator Amidala is doing. I think those are the most tangible just-in-time ongoing, focused, all of the above, ways that we can continue to support teachers in the transition." Encourager and supporter was not a role that

was mentioned repeatedly by the administrative team during the initiative, but much of what Principal Windu put in place and messages he communicated centered around ensuring teachers were being encouraged and had the support they needed.

Family and Community Engager

Principal Windu historically valued engaging and involving the families and the community of Endor and there were many ways he took on the role of family and community engager to specifically support the one-to-one initiative. This role was important because parental involvement began to waver over time as their students grew older in the Lake District. Assistant Principal Rey specifically noted the family engagement challenge they had at Endor, "Fourth grade parents would like to be involved, but we're in a four through seven school and really by the seventh grade they don't really want to be involved." In addition to the decline of parental support once students got to higher grades, the results of a school survey given to the Endor teachers and parents at the end of the previous school year further convinced Principal Windu that increasing family and community engagement should be a goal in the 2015-2016 school year:

> We did go into this year looking for opportunities to engage with our families and I felt like that that had waned for us a little bit and we had lost a little bit of that and I think it showed up for us in our surveys. It was one-year, so we're going to watch it over time. We're not going to throw the baby out with the bathwater so to speak, but we are trying to look for opportunities to engage. I shared that focus with our teachers too and it has been really fun to watch.

Principal Windu took hold of this area of improvement and he spoke about his special role in engaging families and the community:

> I feel like we have a plan in place in house and I think it's that connecting out to the community and that's my job. We put some of that on our teachers this year and we talked a little about that, but I think that it's my job to make sure that this school has a positive community presence. And whether it's the one-to-one initiative or doing the Lake District run with the Lake District Schools Foundation or connecting with our community sponsor at the local bank. Whatever it is in this building, it's my job to help put out a positive vibe from the school. It happens when you come in the school and feel welcomed. It happens when we go out to community events. That's my job. That's probably what I haven't done well enough. My focus will be to try to connect out and have those conversations and I'll do it in my parent organization meetings.

While connecting to the community of Lake District was an overall goal for Principal Windu, the goal also gained special importance because of the one-to-one initiative. Assistant Principal Rey shared, "Being a family and community engager is one of things that's really important. Principal Windu and I have talked about, 'How do we bring them in and kind of talk them through what we're doing?'" The administrative team claimed that during the first semester of the initiative the parents were having a hard time understanding the change associated with becoming a one-to-one school. Rey shared that "parents are struggling a little bit to understand this whole change and where we are headed and so we have had a lot of conversations about how we can support that." Rey also added that the administration needs to support parents with technology just like they do with teachers and students:

> We're also looking at what pieces of technology are our parents still needing help with? It's important for us to understand that there are still parents that are not comfortable with Blackboard and they don't understand how to get in and we are responding to some of those things.

Throughout the initiative, the administration seemed to value the importance of supporting and communicating with the parents of Endor regarding the one-to-one initiative so that they could better support their students during the one-to-one transition and implementation.

To meet the overall goal of engaging families more and helping support families in the one-to-one transition, Principal Windu worked in various roles as a family and community engager. Principal Windu created a school handbook and shared the handbook with the staff, students and parents at the beginning of the school year. The handbook placed a large emphasis on communicating the importance of developing a parent and school partnership and shared pertinent information to parents about one-to-one initiative related items. The handbook included a school and family compact, a Parent Involvement Policy, a Parental Involvement Plan and a School / Home E-Communication page. The Parental Involvement Plan outlined six parental involvement strategies that the school planned on initiating. The sixth strategy actually related to the one-to-one initiative and "welcomed parents to join their students in getting technology support three afternoons a week in the technology lab." This was a welcoming gesture by Principal Windu and helped show the parents and the community that Endor was there to support not only the students, but the parents during the transition of the one-to-one initiative. The School / Home E-Communication page provided detailed information about the

websites and programs that the parents and students would access during the initiative and gave parents information of how to create a Blackboard account.

One of the other things that Principal Windu and the staff did as part of their goal of engaging families and the community more was purposefully inviting parents to visit classrooms so parents could become more comfortable with how the new standards were being taught and how the one-to-one devices were being utilized in class. Principal Windu described how the staff made the decision to more regularly invite parents into their classes:

> One of the things that is kind of catching on a little bit is if you have questions about my class, come in. We have had parents come in and just sit and I think it would have been unnerving to some of our teachers to do that in the past and we have got some teachers that have opened up to that in saying this is not really a big deal, come on in.

In addition to the handbook and classroom invitations, Principal Windu also connected with parents through the school website during the initiative. I visited the website multiple times during the initiative and the homepage included eight rotating pictures in the center of the page. Two of these pictures related to the one-to-one initiative and helped keep the initiative at the forefront of the parents' and communities' mind. One of the rotating pictures on the homepage was a picture of two students working on iPads, with the caption "Collaborating with iPads." The other picture was of four students congregated around a computer working together with the one-to-one initiative name as a caption. The announcements page of the website also had a link for parents to visit the "Blackboard Virtual Help Desk," which linked parents to a technical support site run by Blackboard. In the November newsletter there were a few topics that related to the one-to-one initiative. The first section of the newsletter announced the upcoming parent

events on the TN Ready test and the "What is Your Digital IQ?" parent night that focused on educating parents on the one-to-one initiative and digital citizenship issues.

Principal Windu also took on the role of family and community engager during the initiative by being an active member of the parent organization. I was able to attend one of the parent organization meetings during the initiative and Principal Windu led the first part of the meeting. Windu began the meeting by reviewing the information given at the TN Ready parent night and he encouraged parent organization members to attend the upcoming "What is Your Digital IQ?" parent night. During the meeting the parent organization also voted and unanimously approved the purchase of 20 Nearpod Pro licenses for Endor teachers. Windu also spoke of the importance of the parent organization being an advocate for the school in the community in regards to the one-to-one initiative and testing changes. In a mid-semester interview Windu described the two upcoming parent nights. For those nights to be successful, Windu said, "I've challenged my parent organization board to be an advocate for us." In my observation of the Endor parent organization meeting, the parents were very supportive of Principal Windu and the teachers of Endor. Principal Windu was a valued member of the organization and he utilized his place on the team to support teachers and the one-to-initiative.

Principal Windu organized and co-led a second parent night at the end of the semester with the Digital Conversion Support Team and Technology Coordinator Amidala. Principal Windu was very passionate about organizing a night event to help educate parents about the topic of digital citizenship. He and technology Amidala met and created the structure and the topics of the parent night and then met with the Digital Conversion Support Team to get their

input on the night. The Digital Conversion Support Team created the presentations for the evening and Principal Windu described the parent night in the November newsletter:

> We will be offering a program, 'What Is Your Digital Life IQ?' for our parents. Now that we have experienced the first few months of our iReach Digital Conversion in Lake District Schools, we feel it is an opportune time to connect with our families and share resources, information and statistics on understanding what our students do and can do online and how we can help them establish a positive digital footprint. Please look for flyers offering more information, including meeting times and locations coming home in future Friday Folders.

The parent night began with an introduction from Principal Windu. The parents then went to two twenty-five minute sessions that were led by two pairs of teachers. One pair led a session titled "Digital Citizenship - Social Media and Digital Smarts" whereas the other pair led a session titled "Basic Online Safety (Don't forget the cell phones!)." The latter course focused on tangible suggestions for parents to help their students safely navigate the Internet. There was also a troubleshooting desk for parents during the event that offered parents technical help with laptops and iPads and with the PowerSchool and Blackboard software programs that were being used during the initiative.

Throughout the study, Principal Windu was cognizant of his role as family and community engager. He was reflective about whether or not he was engaging parents enough with the one-to-one initiative:

> Family and community engager, I should have been better at that heading into the school year. That is an area that I wished I had gotten ahead of, but we're going to chase that this next nine weeks. We're getting some information out on assessment and on technology.

While Windu seemed to regret his decision to not engage parents earlier, he was intent on taking on the role of family and community engager more as the semester went on. Assistant Principal Rey reflected on how the administrative team did with taking on this role, "Family and community engager, I think we are getting better at, which is why we are doing some of these parent things." Principal Windu had one final reflection about his role as family and community engager right before they held the two parent nights:

> What we're offering next week and then in December……there's a part of me that thinks I should've done it sooner, but I don't know if it would've been as effective because what I know now is going to make those presentations better and more meaningful.

By the end of the semester, Principal Windu was taking on the role of family and community engager so often that when I asked him which roles he was playing the most he answered, "Family and community engager. That one is hot and heavy right now." By the end of the semester Principal Windu became more proactive in the role of family and community engager as the semester went on as opposed to being reactive. The family and community engager role was a great example of how some roles grew in salience as the semester went on for Principal Windu.

Leader of Ethics in Technology

Leader of ethics in technology was a role that Principal Windu took on a few times during the initiative, particularly in the area of digital citizenship. When he spoke about digital

citizenship with the staff and students he shared that "it's that awareness of what you put out there is a picture of who you are." Principal Windu was aware of the concept of digital citizenship before the initiative began. He was a member of the one-to-one committee in curriculum and instruction that met to plan out the one-to-initiative and the committee often discussed the subject of digital citizenship to lay the framework for the district implementation of the one-to-one initiative. Throughout the initiative, Principal Windu was acutely aware of digital citizenship issues but seemed to rely on Technology Coordinator Amidala to guide him in this area. When I asked him about the role of ethics in technology in his first interview, he responded "Technology and ethics. Technology Coordinator Amidala is my compass. Amidala leads that and my job is to support her in leading that." However, the whole administrative team was forced to embrace this role at times because of some instances where students used their one-to-one devices inappropriately. Windu shared a particular instance where a student accidentally sent an email message to a hidden email group of teachers at the other intermediate school that said "die":

> The student had no clue who she was sending it to because it was a group the student couldn't see. Number one, that's not real smart. Number two, there's education there of understanding that that's not what this device is for.

Some of these student misuse issues seemed to reiterate the importance of teaching digital citizenship at the school level during the initiative.

Upon reflection, Principal Windu thought that the school paid a price for not being more proactive in regard to digital citizenship and educating parents about these issues early in the semester. Windu recalled:

> For the first 12 weeks of school, it's probably been harder on our teachers and our students to deal with some of the things. We've probably, digital citizenship wise, we've had some things happen and we've had some parents question some things that maybe we wouldn't have if we would've addressed it.

Windu felt that since the addition of one-to-one devices was new "it took some time to realize what the kids were going to do and not do with the technology." The administrative team needed some time to fully understand the student technology ethical issues they would encounter before they could effectively communicate with parents.

While Windu shared he wished he would have done more at the beginning of the initiative in regard to taking on the role of leader of ethics in technology, there were a few things that Principal Windu did at the beginning of the initiative to be more proactive in this area. The district did provide Endor with a responsible use policy for both staff and students. Both staff and students had to review and sign the responsible use policy at the beginning of the year, which described the expectation for how students and staff should responsibly and appropriately use their device. Principal Windu and Technology Coordinator Amidala also had the staff teach a digital citizenship curriculum by Common Sense Media throughout the initiative. Windu mentioned, "last year, we kind of piloted what grade levels would get what pieces of that curriculum and then who would deliver the curriculum, so that it permeates through our building." They utilized the pilot year to work out the logistics of who would teach the curriculum and when it would be taught. The entire building taught a portion of the digital citizenship curriculum at some point throughout the year. Windu was purposeful in having the whole staff teach digital citizenship at some point because he wanted the subject of digital

citizenship to "permeate the building and everybody owns it and everybody realizes the staff and the student perspective that we are all responsible for being aware of that and then making sure we hold our kids accountable."

Towards the end of the semester I witnessed Principal Windu take on the role of leader of ethics in technology more than any other time in the semester. At the end of the semester, Principal Windu shared that he thought that the idea of "screen time" would be the next big digital citizenship focus the school would have with students and parents. While the role of family and community engager was not a major one for Principal Windu, it was yet another role that Principal Windu took on to help, lead, support and influence the one-to-one initiative.

HR Harry

In analyzing the large amount of qualitative data that were collected from this case study, the majority of the data of how a principal leads, supports and influences teachers in the implementation of a one-to-one initiative could be coded into the twelve roles that were outlined in the literature review of this study (see Chapter Two). There were certain qualitative data associated with hiring that did not fit into these twelve roles and thus, I created the role of HR Harry. Principal Windu shared some information during the interviews of hiring people with instructional technology and the one-to-one initiative in mind, so a role that captured the human resources role that Principal Windu had to play from time to time before and during the initiative was appropriate.

Principal Windu felt that hiring the right people was a very important part of leading a school and a one-to-one initiative. Principal Windu shared the importance of hiring, "I need to find people who are good at what they do and know why they're good at. I use the word

consciously competent." He went on to explain that these were the type of teachers who knew what they were good at in the classroom and knew how to get results with students. He elaborated that they do what they know is effective with students and find ways to integrate technology when it is appropriate.

During our second interview together, Principal Windu began to describe the unconventional hiring method that he had formulated over the course of his time at Endor Intermediate School. Windu shared that his interview process had evolved over time and the TPaCK model was so influential for him that he tweaked his hiring process before the initiative began to incorporate the model. In Principal Windu's hiring process, he initially posted a teaching position and then narrowed down the applicants to candidates he wanted to interview. He sometimes called or talked to potential candidates in person to determine if he wanted to interview them. The interview process is where his hiring methods were more unconventional. Appendix N outlines the teacher interview process in the final round of interviews at Endor. Principal Windu gave the sheet outlined in Appendix N to the candidates who were interviewing a few days before the actual interview and asked the interview participants to create a 30-minute presentation that addressed four topics. Three of the topics that the candidates had to address in their presentation aligned with the TPACK model and included Content Knowledge, Pedagogical Knowledge, and Technological Knowledge. The Technological Knowledge topic specifically asked the interview participant to discuss instructional technology that they liked to use with students, share technology resources that they liked to use in their classrooms and describe their prior training and experience with technology. The fourth topic was Professional Relationships/Development and in this section the interview participants were asked to watch a

video on the TPaCK model and complete a TPaCK self-assessment by following the website links shown in Appendix N. Once the interview participants were finished with their presentation during the actual interview, they were given a written scenario by Principal Windu and were expected to address the concerns. The interview process reflected Principal Windu's TPaCK focus and his vision that technology is only a good piece of instruction when it incorporates strong teacher pedagogy and content knowledge.

Once Principal Windu hired the right people he also explained the importance of ensuring that the people he hired were in the right places and positions to be successful, "A big piece of my philosophy is putting people in the right place to be successful. A lot of that plays off of who they are as a person and as a teacher." Assistant Principal Rey made the point that "if you have the right teachers in place, it's amazing. There's no limits. That's kind of pretty simple." The role of HR Harry was a great example of the influence the TPaCK model had on Principal Windu's leadership and the balanced leadership approach he took during the initiative by focusing on pedagogy and content and encouraging technology to be a tool for good instruction when it was appropriate.

Summary of the Analysis of Research Question One A and B

The section analyzed Endor's qualitative data through the lens of the first research question:

1. How do principals lead teachers in the implementation of a one-to-one initiative?
    a. How do principals support teachers in the implementation of a one-to-one initiative?

b. How do principals influence teachers' use of technology in the implementation of a one-to-one initiative?

Due to the interview participants' difficulty with separating the ideas of leading, influencing and supporting, question one and the subparts were analyzed together in this section. I analyzed interviews, observations, principal shadowing notes, documents and archival records to decipher codes for the initiative. The codes identified were grouped into the twelve a priori themes that were discussed in chapter two: visionary, digital expert, manager of resources, model of technology use, technology supporter, leader of organizational, structural and policy change, leader of change in pedagogy and learning, leader of cultural change, evaluator of technology, encourager and supporter, family and community engager and leader of ethics in technology. The role of HR Harry was an additional theme that arose in the analysis of the qualitative data. The top three major roles that Principal Windu took on during the initiative were visionary, leader of change and pedagogy, and leader of cultural change. All three of these roles were cited more frequently than any of Principal Windu's other roles that were identified in the study. The teachers' interview responses were not included in this section because they will be discussed in the following section in the analysis of question two.

Analysis of Research Question Two

The following section analyzes the qualitative data from the study of Endor Intermediate School in order to answer the following research question of the study:

2. How do teachers perceive the principal's efforts to lead, support, and influence the teaching staff in the implementation of a one-to-one initiative?

The teachers expressed difficulty in separating the ideas of lead, support and influence when answering the interview questions, so these three ideas will be reported together in this section. I will share if a teacher grouped their response or responses into a particular category of lead, influence or support.

Four teachers' interview responses were analyzed in this section. The four teachers interviewed had diverse backgrounds, taught different subjects, held various years of teaching experience and had a variety of technology proficiency levels. All of the information in this section is based on teachers' responses and perceptions of how the principal led, supported and influenced the teaching staff in the implementation of the one-to-one initiative. The qualitative data were analyzed through the lens of the second research question and the theoretical framework of the study. Throughout the analysis of the qualitative data, codes emerged and were further analyzed to sort and group them into the thirteen a priori themes. The thirteen a priori themes that were outlined in the literature review were: visionary, digital expert, manager of resources, model of technology use, technology supporter, leader of organizational, structural and policy change, leader of change in pedagogy and learning, leader of cultural change, evaluator of technology, encourager and supporter, family and community engager, leader of ethics in technology, and HR Harry. In this section I will discuss the teachers perceptions of the roles Principal Windu played during the initiative and discuss how they related to the principal's own perceptions of their leadership efforts during the implementation of the one-to-one initiative. The rankings of the teachers' perceptions of the roles Principal Windu took on while leading, influencing and supporting the one-to-one initiative can be found in Table 8. The rankings are based on the coding totals for each role during the data analysis.

Table 8

Rankings of the Teachers' Perceptions of Principal Windu's Roles

Role Ranking	Principal Windu
#1	Visionary
#2	Leader of Change in Pedagogy & Learning
#3	Leader of Cultural Change
#4	Encourager and Supporter
#5	Technology Supporter
#6	Leader of Organizational, Structural & Policy Change
#7	Digital Expert
#8	Manager of Resources
#9	Evaluator of Technology
#10	Model of Technology Use
#11	Family and Community Engager
#12	Leader of Ethics in Technology
#13	HR Harry

Note. Rankings are based on coding frequency totals for each role during data analysis.

Background of the Teachers

Teachers in this section will be given a letter A, B, C, or D to designate them as opposed to sharing their names in order to protect their identity. As described in chapter 3, I used purposive sampling in the selection of teacher interview participants for this study. Teacher interview participants were identified through interviews and conversations with principals and assistant principals, PLC observations and most importantly classroom observations. Classroom observations were extremely important in identifying teacher interview participants because the observations gave me an opportunity to see the teacher during instruction and informally evaluate their use of instructional technology in the classroom. The purposive sampling was conducted in order to garner a diverse group of teacher interview participants with diverse backgrounds, various years of teaching experience and multiple levels of technology proficiency. The purposive sampling also allowed me to choose teachers who taught a variety of subjects and

grade levels. The grade levels the teachers taught will not be discussed in order to further protect the identity of the teachers. Table 9 lists the teaching experience, subject taught and the overall technology proficiency of the teachers that were interviewed. The technology proficiency ratings were self-reported by teachers during their interviews and teachers ranked their technology proficiency on a scale from 1 to 10, with 1 being the lowest technology proficiency and 10 being the highest technology proficiency. Only one of the teacher interview participants was an Early Adopter, which meant that this was the first year that three of the four interview participants had adopted one-to-one technology in their classes. This diverse collection of teacher interview participants enabled me to analyze the second research question from multiple angles and viewpoints.

Table 9

Teacher Interview Participants from Endor Intermediate School

Participant	**Years of Experience**	**Subject Taught**	**Technology Proficiency**
Teacher A	≥ 20 years	Math	3
Teacher B	≥10 years	Science	9
Teacher C	≥ 15 years	Language Arts	7
Teacher D	≥5 years	Reading/Social Studies	9

Note. Technology proficiency ratings were self-reported by teachers and teachers rated themselves on a scale of 1 to 10, with 1 being the lowest proficiency and 10 being the highest proficiency.

Visionary

According to Principal Windu and the administrative team, the role of visionary was the most cited role that Principal Windu took on during the initiative. Teacher interviews confirmed the principal's perceptions because the role of visionary was the teachers most cited role that Principal Windu took on as well. The teachers spoke about Principal Windu's vision overall, but spent the majority of their time talking about how Principal Windu set a vision of "it's ok where you are with technology as long as you are moving forward." When I spoke to teachers about the role of visionary, teachers shared that the vision did not just come from Principal Windu but the whole administrative team.

Overall, the teachers believed that Principal Windu was the person that set the tone for the school. Teacher A declared, "So much of what you accomplish as four grade levels, as twenty to thirty something classrooms, comes from the top down." Teacher D referenced the example of a pulse when discussing the importance of a principal's role in implementing a one-to-one initiative, "They're the face of it, just like as a teacher you are setting the pulse of the classroom a little bit, if they're calm and excited it's going to radiate through the rest of the people." In addition to his ability to set the tone, Teacher A shared that Windu's vision was to be a cutting edge school:

> I don't think there is any question that he is a visionary. He wants to stay on the cutting edge. He wants people like you to be in this building and going out reporting what a wonderful job we're doing. He wants to be a state and nationwide recognized school.

The teachers didn't share much about Principal Windu's overall vision for the school outside of technology, but Teacher B confirmed that the overall school vision and goals did not change

because of the implementation of the one-to-one in initiative. While Windu and the administrative team discussed many details about the vision of preparing students to be college and career ready, the teachers did not reference this vision for Principal Windu except one teacher's brief statement about using technology to level the playing field for jobs.

The area of Principal Windu's vision that teachers consistently shared was the vision of "it is ok wherever staff members are with technology, but everyone needs to move forward with technology from where they are." This was a large theme of the administrative interviews and the frequent mention of this vision by teachers confirmed the importance of Principal Windu's vision with the staff. Teacher B shared the vision that was consistently communicated by Principal Windu, "That's what they've always told us, you're all going to be at different spots and that's okay to be where you're comfortable." The teacher interview participants also frequently mentioned that the communication wasn't just about being ok where you are, but was also about growth:

> They have done a good job of making sure that we understand that what our comfort level is, that's our comfort level and try to push out of it a little bit, but they don't expect it to look the same in every classroom.

In communicating the importance of growth, teachers believed that the administration supported their comfort level with technology, but encouraged teachers to try something new:

> They have been very supportive. They have said everyone is on a different level of comfort with it because we have new teachers to some of the old teachers that have been here for many, many years. So there is no right or wrong where you are, as long as you are trying something, and that's the direction that you need to be going in.

Teacher A believed that the vision that Principal Windu communicated helped teachers to feel comfortable with where they were and this helped create buy-in with the Endor teachers during the initiative, “I think because people are comfortable at whatever place they are with this whole thing, has gotten buy-in and I think the buy-in is probably maxed out. I'm not telling you it's 100%, but I'm saying it's maxed out.” Teacher A stressed that a key thing the administration did during the initiative was not only communicate this vision, but that they stood behind the vision and meant what they said, “With Principal Windu and Technology Coordinator Amidala and Assistant Principal Rey and Assistant Principal Ackbar, when they say it that's what they mean. That's what's so great about working here.” The teacher also expressed how the vision was a part of what made Endor such a great place, “They just want you to try and I think because of their perspective and their approach and their philosophy with that, I think that's one of the reasons why this place is as remarkable as it is.” This vision seemed to impact two teachers more than the other two teachers, but all four teachers referenced how important it was to be able to feel supported no matter their technology proficiency level.

Principal Windu spoke extensively of how the TPaCK model shaped his vision and in an interview Teacher D made a reference of how the TPaCK model influenced the vision of the school, “Visionary would have come from the model that they adopted, TPaCK maybe. There is that, where we do kind of know where we are headed.” Principal Windu also shared a lot of information about the vision of how “it wasn’t about the technology” and how the focus remained on instruction and assessment. Teacher D praised Principal Windu’s and the administrative team’s vision of staying focused on what had made the school successful in the past when Teacher D gave advice to other schools adopting a one-to-one initiative:

> I think that what's been big is your school doesn't lose its identity in all of this and that you still say focused on what has always made you successful and that's something that I think they are aware of. They're all very aware of things and they have a certain vision for the school.

Principal Windu discussed communicating the vision of technology being a tool and teachers shared their belief that technology was a tool, but only one teacher mentioned Principal Windu sharing this vision. In an interview Teacher B shared that Principal Windu stressed that the devices were tools for instruction and not toys. Teachers at Endor seemed to place equal importance in Principal Windu's role of visionary as the administrative team did during the one-to-one initiative and this helped support the strength of the findings.

Digital Expert

Teachers saw Principal Windu as a digital expert and felt that he was able to take on the role of digital expert mainly because of his background as a technology coordinator at the Lake District. Teacher B and C both mentioned in their interviews that he was formerly a technology coordinator. "I have always considered Principal Windu a digital expert," shared Teacher C, "I've always seen him using technology, demonstrating technology, helping us if we need help with technology or learning something with it." Teacher B shared, "I think it's nice that Principal Windu was a technology coordinator before he was principal and now having all this. Teacher A and C both specifically mentioned that they thought Principal Windu remained a digital expert during the implementation of the one-to-one initiative. Teacher C shared, "he still keeps up with everything," while Teacher A claimed that "Principal Windu knows how to use virtually everything. He probably sits down there in his office and makes sure he knows how to

do things." Windu's and Rey's technology background and current technology expertise influenced Teacher C to feel comfortable with relying on their digital expertise in various ways, "I've always seen them as people to go to for help with technology or to know the latest and greatest kind of thing with that." Principal Windu discussed at great length how he was struggling to keep up with all the new technology programs and resources, but teachers did not seem to notice this struggle or perceive Windu to be anything but a digital expert. While Windu felt that it wasn't necessary for him to be a digital expert when leading the one-to-one initiative, the teachers did seem to find value in Windu's technology background and expertise. When I asked teachers whether it would make a difference in the initiative if Principal Windu didn't have a technology background or have an overall technology proficiency, three out of four mentioned that it would make a difference. In response to the question, Teacher D answered, "Probably. Because I think that having a background he can maybe anticipate things more and you know how things can go wrong and so you can't plan for things if you can't anticipate what's maybe going to go wrong." Teacher A said yes that it would make a difference in the initiative if he didn't have a technology background and explained, "it's part of who he is as a leader." Overall, the teachers respected his technology background and digital expertise during the first semester of the initiative.

Manager of Resources

In the teacher interviews, participants mentioned Principal Windu taking on the role of manager of resources. Teacher C reflected on the roles that Windu and the administrative team took on during the initiative and shared, "Definitely great managers of resources. We haven't had to worry about anything. They've got that organized and down to a T." Teacher B and C

specifically focused on how Principal Windu took on the role of manager of resources when fielding software, resource and subscription requests from teachers. Teacher B and C discussed how supportive Principal Windu was whenever the teachers approached him to purchase a new software or technology resource. "It's nice that they're open to new things. That they're open to making new subscriptions for us," shared teacher B. Teacher C even mentioned that the administrative team took on the role of manager of resources by consistently evaluating technology programs on their own to help them make an informed decision when teachers requested specific software:

> They always evaluate the different programs and the different technology. I know a lot of it has gone on behind the scenes and different committees and things like that to evaluate everything. They also encouraged us to evaluate different programs and things like that and see if they are any good and see if we should invest in them and things like that.

In addition to supporting technology software and resource requests, Teacher B also referenced the administrative team's support of teachers attending professional trainings or conferences outside the district, "They seem to be open to trainings we want to go to. You know if we have the money they will send you." The teachers frequently spoke of the administrative team as a whole when discussing the role of manager of resources, but based on their perceptions it appeared that they felt that this was mostly a role that Principal Windu took on during the initiative.

Model of Technology Use

Teachers didn't mention the role of model of technology use very often, which aligned with Principal Windu and the administrative team rarely mentioning the role. This, however, did

not take away from the importance of the role of model of technology because teachers still referenced how influential this role was. Overall, teachers felt that it was important for Principal Windu to model technology for the staff. Teacher C described the importance of Principal Windu taking on the role of model of technology use:

> If he's not demonstrating all of those things, then the culture in the school is not going to reflect. They'll say, 'Hey he doesn't really believe in this so why are we? This is just another program, just another initiative that will be here and be gone.'

Teacher C believed that it was very important that Principal Windu believed in the initiative and used the technology himself. Teacher A was one interview participant who especially felt that Principal Windu's role of model of technology was extremely important. He believed strongly that a principal can't ask teachers to do something and not do it themselves:

> I've talked to people at other schools and one of the frustrations you hear is, you are asking me to do this and you don't do it. You don't model it for me. You're not an expert. I think at this school that is one of the things that they are making sure that they do and Principal Windu knows how to use virtually everything.

Teacher A went on to explain, "He's not going to ask people to do something he's not willing to do himself. That's effective and that's part of being a successful teacher and a successful coach too." This role was particularly important to Teacher A because he had a similar approach to his teaching and coaching. He shared an example of modeling as a coach, "If I'm going to ask a kid to come lift at 6:30 in the morning, I need to be there, too. I don't need to be showing up once a week. I need to be in there with them." The teachers believed that Principal Windu didn't just

ask teachers to implement the initiative, but he was an involved leader in the initiative that modeled technology use. Teacher A explained that this wasn't true at every school:

> There are a lot of principals that are relying on the technology coordinator to do everything, while they continue to do things. They have made that technology coordinator more of a manager. There is no question here that the leader here is Principal Windu.

According to Teacher A, this modeling sent a powerful message to teachers, "There is no question it sends a message. It must because I'm hearing about it." Teacher A shared that he heard teachers talk about Principal Windu modeling technology to other teachers. The role of model of technology use wasn't necessarily a predominant role for Principal Windu from the perspective of the teachers, but when he took on the role, it was noticed by teachers and was a meaningful role.

Technology Supporter

The teachers frequently referenced Principal Windu's background as a technology coordinator when speaking about the role of technology supporter. Teacher B felt that this technology background helped her to feel comfortable with approaching Principal Windu for technology help:

> I think it's nice that Principal Windu was a technology coordinator before he was principal and now having all this because it would not be uncommon to text Principal Windu or call and say this isn't working, can you come help me with this.

For the teachers, Principal Windu's support went beyond just having a technology background. The teachers explained that he had this background and knowledge about technology, but he also

always seemed to offer support if teachers needed help with technology. Teacher B shared, "Sometimes we have them in here on a stool trying to figure out the projector if it's not cooperating. Not everybody could do that or be willing to." Teacher B explained how nice it was to have a principal like this, "Whether it's a technology support issue or not, it's nice to have someone who's willing to jump in and put their hands in it, too." Teacher D shared an example of Principal Windu attempting to help her with an iPad problem she was having in the hall. While Principal Windu wasn't able to help with the particular issue, he was willing to try and the teacher appreciated his willingness to help.

The teachers also referenced the technology support pieces that Principal Windu put in place. Principal Windu spoke a lot about the seven layers of support in his interviews and while teachers didn't specifically reference the seven layers of support, they did talk about various support layers that Principal Windu had established in their interviews. Teacher B spoke of how nice it was to have so many different technology supports available to teachers. Teacher C spoke about the second layer of support, the Help Desk support, and the fourth layer of support, the FreshDesk Ticketing system:

> If we need anything fixed or whatever, they have put in place a system to help us out which is email the Help Desk and in a little while or the next day someone is there to help us and help us address that problem.

Teacher C explained how helpful it was to have a support like this:

> If the students are having a problem with their laptops, I email and they are usually there at some point during the day to address that student's issue. So that's a huge, if we didn't have that that would be a serious issue with this whole initiative.

Teacher D referenced the importance of the third layer of support, the Building Level Technology Coordinator and said, “I think it’s a very valuable role.” Teacher D also mentioned the fifth layer of support that Principal Windu created, the Early Adopter mentor program as a support that was helpful for teachers. Teacher D shared that this was a helpful support that Principal Windu setup because “you know immediately who you can go to.” Teacher D explained that she met with her Early Adopter mentor weekly at the beginning of the semester to talk about different technology programs. Teacher C, in particular, felt that Principal Windu taking on the role of technology supporter and helping establish technology supports was one of the most important things he accomplished during the initiative, “Just providing the support, the physical support for the students with the functioning of their laptops, I think that's been huge.” Teacher C later explained why this support was so critical, “I think that has been a key component because I think there was some worry about that with parents that if something goes wrong then we are left out there in the cold and kids can’t do their work.” Overall, the teachers agreed with the administrative team and felt that the technology supports that were created helped and there were very few major technology issues during the initiative. Teacher C shared, “There's been a few glitches here and there, but they have made sure all of those issues have been thought about at least and addressed beforehand, so that's been a great effect.” Teacher B addressed her thoughts on the initiative thus far, “I think everything has been well thought out and any tweaks have been pretty minor.” The teachers seemed to appreciate Windu’s technology background, his willingness to provide technical support throughout the semester and they also felt that the technology supports that were established helped teachers feel supported during the initiative and, ultimately, led to less technical issues.

Leader of Organizational, Structural and Policy Change.

The role of leader of organizational, structural and policy change was sometimes hard for teachers to comment on because many of the organizational and structural changes were made behind the scenes by principals. The teachers still felt that Principal Windu took on this role in the initiative, mainly in the way that he established structures to support teachers during the initiative. Teacher D felt that Principal Windu took on this role because of how thorough he was when making decisions:

> I would also say infrastructure of change. I think he's very methodical in every decision. That it is not just I'm feeling this, it's all very well thought out even years ahead of time. Like eventually I know this is where we are going.

Teachers felt that Windu took on the role of leader of organizational, structural, and policy change in the way he created structures to support the initiative. The teachers mentioned structures like the Help Desk, Technology Coordinator Amidala, and Early Adopter mentors. All of these support structures made teachers feel comfortable with where they could go for help pertaining to the one-to-one initiative. Teacher D explained, "I don't have a question in my mind about what I'm supposed to do and if I do have a question, I know who to ask." Teacher C believed that providing these "physical supports" to teachers was a "huge" part of the one-to-one initiative. Teacher B described how helpful it was having a variety of ways to receive support during the initiative, "I feel like they do a good job with making things available, offering support and we're really lucky to have people that can come running if we need that help."

The Help Desk was one of the layers of support that Principal Windu established that was especially meaningful to Teacher C. Teacher C felt that the Help Desk was a "key component"

to the initiative because it allowed her and her students to usually receive same day technical support. Without this support layer, she claimed that there would be a "serious issue with this whole initiative." Another one of Principal Windu's layers of support that was regularly referenced in the teacher interviews was the Building Level Technology Coordinator Amidala. When I asked Teacher D about the some of the most important things Principal Windu did to lead, support and influence teachers in the one-to-one initiative, she answered, "Providing us with a technology coordinator and having that job." Teacher A explained that it wasn't just Windu establishing her position, "One of the crucial aspects I think is the role and responsibilities he's given to Technology Coordinator Amidala." Overall, many of the teachers thought that Technology Coordinator Amidala was a valuable staff member who supported the implementation of the one-to-one initiative in many ways. Teacher A shared, "Having her in that role, in that position, just the kind of person she is, is what makes this thing go. I think she really makes Principal Windu look good and he knows that." Teacher D also briefly referenced Windu's fifth layer of support, the Early Adopter mentors, and how they were another important layer of support for the staff.

Teacher D also referenced an important organizational decision that Principal Windu made before the initiative began. Teacher D talked about how strategic Principal Windu was in his decision to choose Early Adopters. Twenty three teachers applied to be Early Adopters and Principal Windu selected 14 to be Early Adopters and Teacher D explained her perception of Principal Windu's choices, "It was very strategic in that each team had someone and he tried to make it where each subject level had someone, so that there was someone at every angle kind of."

The teachers didn't reference any of the personnel changes that Principal Windu made with teaching assistants and the Help Desk for the initiative, but they did briefly mention some of the policies that were put in place. Teacher D was pleased with the overall policy decisions made for the initiative, "I think policies have been established well." She also mentioned the Super Six procedures (see appendix L) as another effective policy decision Principal Windu made. The teachers did not detail all of the organizational, structural and policy changes that the principal made during the initiative, but they were aware of the some of the big changes that Principal Windu made in the role of leader of organizational, structural and policy change.

Leader of Change of Pedagogy and Learning

The role of leader of change of pedagogy and learning is a role that focuses on helping teachers use technology to enhance student outcomes and pedagogy. The teachers felt that Principal Windu took on this role by communicating clear technology expectations and through connecting teachers with one another. "I think they have done a great job of communicating what their expectations are," shared Teacher A. Teacher A went on to explain that Principal Windu's clear expectations helped to make the one-to-one implementation a "seamless" transition, "I think it's communication. I think bottom line is there has been effective communication about how this is going to work and about it being okay that it is not perfect." Teacher D highlighted Principal Windu's clear expectations and how those expectations affected the initiative, "I think that being very clear about expectations and being calm about things, especially when it's a big shift like this, is huge. It sets the tone for everything."

Teachers reported that Principal Windu was clear in having no expectation for technology use during the initiative. Teacher C shared, "It's never been where they have said, 'You have to

use your laptops every single day in class.' They never mandated that." Teacher D explained, "As far as the minimal requirement for having to use it, they have always been clear that there isn't one. That you don't have to use it." The teachers felt that Principal Windu and the administrative team were clear in not having an expectation of technology use and this no pressure approach positively impacted many teachers and the way they used their one-to-one devices in the classroom. Teacher D went on to share more about the administrative team's technology expectations:

> Use it when it feels right. Use it when you are ready. Their approach has been like look how great it is, so the teachers are going to want to use it and so that they're not forced to use it. Here are the opportunities for using it and any good teacher is going to want to use it because of that, right? So I think that's the difference. No one ever really felt forced, like the opposite.

Every teacher interview participant spoke positively about this approach and Teacher B believed that teachers would have reacted negatively if Principal Windu had taken a more forceful approach, "I think if it were something they pushed and said, 'We want to see them being used every period of every day', then it would be like this with a lot of people. Hands-off. I'm not interested. I don't want any." Teacher B continued to explain about the advantage of Principal Windu taking an approach where no computer expectations were set, "I think that has been really beneficial. A good way to lead." The teachers believed that Principal Windu's approach where no computer use expectations were set ultimately enhanced student outcomes and teacher pedagogy more than if he would have set strict computer usage expectations.

The teacher interview participants also referenced how Principal Windu utilized instructional support meetings, open classroom observations and staff meetings to help connect teachers with one another so they could share ideas and help each other to improve their pedagogy and student outcomes. Teacher D was the only teacher to mention the instructional support meetings that Principal Windu and Technology Coordinator Amidala had created. Teacher A and D both commented on the value of the open classroom observations that were established by Principal Windu and Technology Coordinator Amidala. Teacher A mentioned the importance of Amidala sending the emails to the staff that announced when an open classroom observation was being held, because these observations gave teachers an opportunity to watch how other teachers were using technology in their classrooms. Teacher D commented on the open classroom observations, "I think the way that they have handled resources has been really helpful. The way that they have been shared out and the way that teachers have taught teachers." Teacher B also referenced the portion of the staff meeting when teachers would share technology ideas with the staff as a helpful way Principal Windu connected teachers. Teachers believed that the most influential way that Principal Windu took on the role of leader of change of pedagogy and learning was in his clarity in communicating that there was no specific expectation of technology usage during the initiative other than that they were expected to grow in their use of technology. This approach allowed to teachers to focus on instruction and they felt no pressure to use technology, which allowed the teachers to utilize technology when technology was appropriate and when technology could enhance student outcomes and pedagogy.

Leader of Cultural Change

Endor teachers spoke at length about the culture of the school and how Principal Windu took on the role of leader of cultural change during the initiative to create a culture where teachers felt no pressure to use technology and to create a culture where teachers shared ideas with one another. Teachers seemed to appreciate Principal Windu's vision of "it is ok wherever you are with technology, but everyone needs to move forward with technology from where they are." According to teachers, this vision along with Principal Windu's consistent communication that there were no computer usage expectations during the initiative, helped to establish a culture where teachers felt no pressure to use technology. The teachers' responses aligned with the no pressure culture that Principal Windu wanted to create at Endor and the type of culture he consistently shared about in his interviews. Teacher D explained:

> I don't feel like I've ever been pressured to use it. It's never been you have to use it this many times because we've spent money on it, so use it. It's always been here is this tool, see how you can use it best.

Not putting pressure on teachers to use technology helped establish a culture where teachers felt comfortable shared Teacher D, "They were so good about making sure people felt comfortable and not that we're going to be breathing down your necks if you're not using technology." According to Teacher B this type of culture especially helped more experienced teachers who were sometimes more reluctant to use the one-to-one devices, "Like I said cultural change, I think they've done a great job trying to help, especially the older teachers to feel more comfortable with the change in the technology use, because it can be scary." Teacher A explained that the no pressure culture and no pressure approach from the administration is what

ultimately made him "buy-in" to the implementation of one-to-one implementation. He shared with me that he had a negative reaction when he first heard the district would be adopting one-to-one devices across the district. He was worried about the computers not working, the computers being distractions and most of all he was worried about what would happen if he didn't use the technology "enough." Because of the no pressure culture that Principal Windu established, he shared, "If he comes to evaluate me and the students don't take the laptops out, I'm not the least bit worried that I'm going to get marked down because I didn't have technology in my lesson." This was a great example of how Principal Windu's culture helped a reluctant technology user and experienced teacher to believe in the school's one-to-one initiative. Teachers reported feeling this no pressure culture from all members of the administrative team. Teacher A shared about the consistency of this message:

> It's almost like everyone has been told, everyone is on the same page, when they get up and present the information they say, 'Hey we are going to show you this. We want you to play around with it a little bit, but we don't expect everybody to buy into this or go full board.' It's almost like they've been coached to make sure they communicate that. Because they don't want anybody to be overwhelmed and they don't want anybody to get frustrated and they don't want to lose anybody.

Teacher A mentioned that this no pressure message was even communicated when Technology Coordinator Amidala sent notifications out about upcoming open classroom observations. He reported that when Amidala sent out the open classroom notifications Amidala would write, "Hey we're going to do this today. Come down and check it out and if you want to try it, I will help you. This is not something that you have to do." The teachers felt that the administration

really didn't need to put pressure on teachers to use technology because teachers often put a lot of the pressure on themselves:

> We put a lot of pressure on ourselves. So I don't think the administration has to do that because were always like, 'Oh, gosh, I really need to do that.' How can I use technology for this? So we put a lot of pressure on ourselves to do that, so it is nice to have the administration kind of say, 'Hey it's okay wherever you are, as long as you are trying to learn something new, then you are where you need to be.'

Teacher A felt that Windu's no pressure approach was not common at other schools around the district, "I can say conversations I've had with other people at different places, a lot of places they feel like things are being forced on them a little bit more than they are here." An example of this was one time in a PLC observation, I heard a teacher say that another school had to use OneNote, but at Endor "they can do what they want." Based on the perceptions of teachers, Principal Windu's no pressure culture had been established before the initiative began. Teacher interview responses seemed to confirm Principal Windu's "no pressure" cultural approach.

The teacher interview participants also believed that Principal Windu took on the role of leader of cultural change during the initiative to create a culture where teachers shared instructional technology ideas with one another. The teachers detailed a variety of ways that teachers shared with one another including instructional support meetings, open classroom observations, faculty meetings, grade level team meetings, emails to team members and professional development sessions. Teacher D believed that the instructional support meetings were a good way for Technology Coordinator Amidala to share with teachers and she felt these meetings "were good" and there was always "some sort of nugget" that would come out of the

meetings that teachers would use. Teachers talked a lot about the open classroom observations and how they allowed teachers to share and learn from one another. Teacher C described the meetings, "Even with our own school, we have opportunities where teachers will say, 'Hey I'm going to be doing this or using this program or whatever in my class if anyone wants to come in and observe it'." Teacher D explained that Windu and Amidala were so committed to supporting the open classroom observations that they would offer to find classroom coverage for a teacher if they were teaching a class when the open classroom observation was occurring. Teacher D explained that if you wanted additional help after attending the open classroom observation "you can email Technology Coordinator Amidala and she can come in and teach the lesson with you if you're unsure. They thought all of those things through." Teacher B mentioned that teachers would share with one another in faculty meetings and team meetings. Teacher B also mentioned that her grade level team "emails and texts just about all the time. 'Hey, have you tried this?'" Teacher D shared that her team met weekly at the beginning of the semester with their Early Adopter mentor to discuss technology ideas. Teacher C even mentioned that their whole structure of professional development changed during the initiative so that "now it's such an encouragement if you are a teacher when you have something you want to share out." Teacher C felt that the new professional development structures helped create a culture where "everyone could be learning from everybody." Teachers' reports of Principal Windu taking on the role of leader of cultural change by creating a no pressure culture and creating a culture of sharing both aligned with what Principal Windu and the administrative team reported. The alignment between the principals' responses and the teachers' responses helped validate the details of Principal Windu's role as leader of cultural change throughout the initiative.

Evaluator of Technology

The evaluator of technology was not a role that aligned with the teachers' perceptions of Principal Windu's leadership during the initiative. Principal Windu didn't identify with this role during the initiative and the teachers agreed with his responses. Only one teacher mentioned him taking on this role and had very few details to share. Three of the four teachers interviewed seemed to think Windu encouraged teachers to use technology rather than evaluating their technology use. Teacher C explained that Principal Windu encouraged rather than evaluated the use of technology when doing walkthroughs and evaluations:

> He really encourages us to use technology. Like I said nothing forced, but if they happen to walk through and they see us using technology, they will leave a little positive note for us that says, 'Hey I really liked how you used this. The kids were all engaged in this.'

Teacher B further explained Principal Windu's encouragement as opposed to an evaluative approach by describing how she thought Windu would handle a teacher who was never using their one-to-one devices:

> I'm sure he would question if a teacher never ever used them at all. Right. I'm sure he would have some conversations and say, 'What can I do to help you feel more comfortable using these?' I think that's more his approach than, 'Why aren't you using these? This is not okay.' That's not his style of leading.

Overall, the teachers' perceptions of the role of evaluator of technology reaffirmed Principal Windu's responses that he didn't focus on evaluating technology use during the first semester of the initiative.

Encourager and Supporter

Like with Principal Windu and the administrative team's responses, the teachers didn't reference Principal Windu's role as encourager and supporter as much as some of the other roles. However, this did not diminish the importance of Principal Windu's role of encourager and supporter for teachers. All four of the teachers highlighted the role of encourager and supporter when they were asked which of the roles stood out the most for Principal Windu. Teacher D shared, "I think encourager and supporter is probably one of the biggest ones." Teacher B shared that "the one that stands out a lot is the encourager and supporter because he is willing to support in any way that we need help." Teacher C felt that Principal Windu taking on the role of encourager and supporter was one of the most important things he did in leading the one-to-one initiative. Teacher C equated encourager and supporter to servant leadership and shared how important it was for Principal Windu and the administrative team to serve the teachers during the initiative, "That whole servant leadership role. We have to see in them that they are willing to help us with whatever we need to do our job, so I think that's vital." Teacher C felt strongly that Principal Windu and the administrative team were servant leaders in their approach and explained why, "I've seen some of the qualities in their personalities and what they do and the time and the care that they have taken to help out the teachers and it helps support them and make them feel comfortable." The role of encourager and supporter was a role that resonated with the teachers in describing what they needed from a principal during a one-to-one initiative. Teacher B believed that the role of encourager and supporter was so important that many of the other roles Principal Windu took on "can fall under the encourager supporter." Teacher B explained, "encourager and supporter can be an umbrella for a lot of these other roles." Teacher

C described how Principal Windu and the administrative team encouraged the teachers through notes and evaluations:

> They will leave positive notes or even on our evaluations it seems like they are looking for that component. They'll say, 'Hey, I really enjoyed seeing your class do this with technology today.' They're kind of encouraging us to keep on, which makes sense. This is a huge investment that they have made.

These notes and words of encouragement seemed to be very meaningful for Teacher C.

The teachers shared additional information about the support portion of the encourager and supporter role for Principal Windu. Teacher A detailed:

> The support here is remarkable. Even if I needed help from Principal Windu about something I thought he could help me with, there's no question I can ask him. If he doesn't want to do it, he would say I'm going to get somebody who can help you with that.

The teachers appreciated the support that Principal Windu offered in various ways. Teacher A felt supported because his opinion was not only valued but heard and this helped him to feel supported by the administration. Teacher D thought that Principal Windu helped support teachers and made them feel heard by allowing them to share their concerns at any time:

> I think constantly communicating with people and letting them talk through things and share their concerns because teachers are going to talk regardless. It's better to talk in the group and make it feel productive than if you are just getting yourselves all worked up on the outside. I guess getting plenty of opportunities to feel like you've been heard because we all like to gripe.

Another way that teachers referenced that Principal Windu supported teachers and gave them an opportunity to voice their opinions and concerns was through an anonymous annual survey that Principal Windu gave to teachers at the end of the school year. Teacher C explained that Principal Windu sent out a survey that "asked us what kinds of things you want us to keep doing, what kinds of things do you want us to stop, what type of things do you want us to start." Teachers believed in the importance of Principal Windu's role of encourager and supporter and it was likely that by effectively encouraging and supporting teachers this positively influenced some of the other roles he took on during the initiative. Even though the role of encourager and supporter was not the most cited role by teachers, teachers saw this role as one of Principal Windu's most important roles during the initiative.

Family and Community Engager

Principal Windu shared information in his interviews about how he not only took on the role of family and community engager, but how he truly valued the role. All four of the teachers briefly mentioned Principal Windu as the family and community engager in their interviews. Teacher A shared, "Family and community engager. That definitely suits him." "Definitely family and community engager, I mean you have to be. This was a huge undertaking and they did it. They pulled it off," said teacher C. Teacher D explained, "Community engager, there was a lot of stuff we did with the parents and keeping them informed." Teacher B was the only teacher to specifically reference any of the parent nights that Principal Windu helped organize and plan. Teacher B talked about how Principal Windu, Technology Coordinator Amidala and the Digital Conversion team planned the "What is Your Digital IQ?" parent night. When

reflecting on Windu's role as family and community engager and the upcoming "What is Your Digital IQ?" parent night, Teacher B shared:

> I think it's important that we are planning to provide that and I know Principal Windu and Technology Coordinator Amidala are a big part of that and I think that's great. I think that's important that the parents and community feel like they're a part of this whole process with us.

Very few details were shared by teachers about Principal Windu's role of family and community engager.

Leader of Ethics in Technology

Leader of ethics in technology was a role that was mentioned only a few times by the teacher interview participants at Endor. Teacher A described the administrative team's approach to the role of leader of ethics in technology:

> Leader in ethics and technology, we are constantly going back and revising. Going back and going 'Uh oh, this was something we weren't anticipating.' They are getting on email, they are forming groups, and they were communicating through groups and they were doing some inappropriate stuff like that. That is addressed and taken care of immediately.

Teacher D shared that digital citizenship was "huge" focus at Endor and believed that Principal Windu and the administrative team played a role in leader of ethics in technology, "I think it's all of them working together and they have kind of outlined that as being a big deal." The teachers seemed to believe that Assistant Principal Rey and Assistant Principal Ackbar dealt with more of the student disciplinary issues involving technology than Principal Windu.

HR Harry

The role of HR Harry or information related to hiring was not mentioned in any of the teacher interviews.

Summary of the Analysis of Research Question Two

This section provided an analysis of Endor's qualitative data through the lens of the second research question:

2. How do teachers perceive the principal's efforts to lead, support, and influence the teaching staff in the implementation of a one-to-one initiative?

The teacher interview participants struggled to separate the ideas of lead, support and influence and thus these ideas were looked at conjointly while interviewing and analyzing the teachers' interview responses. The second question was answered through the analysis of four teacher interview responses. The teachers interviewed had a variety of levels of technology proficiency, teaching experience and most of them taught different grades and subjects. The teacher responses were analyzed to determine what roles Principal Windu took on and how he played these roles during the initiative. The codes identified were sorted into the thirteen a priori themes outlined in the literature review and in the analysis of question one. The roles were visionary, digital expert, manager of resources, model of technology use, technology supporter, leader or organizational, structural and policy change, leader of change in pedagogy and learning, leader of cultural change, evaluator of technology, encourager and supporter, family and community engager, leader of ethics in technology and HR Harry. The teacher responses and roles cited were also compared to the administrative team's responses to give further validity to the findings.

The teachers' top three most cited roles for Principal Windu were exactly the same top three roles that Principal Windu and the administrative team shared. The top three roles for research question one were in exactly the same order as the teachers perceived roles in research question two and they were visionary, leader of change in pedagogy and learning, and leader of cultural change. Principal Windu's vision of "it is ok wherever staff members are with technology, but everyone needs to move forward with technology from where they are" resonated with teachers and helped create a culture where teachers felt no pressure to use their devices. The similarities between the teachers' responses and the administrative team's responses helped validate the main roles that Principal Windu took on while leading, supporting and influencing the implementation of the one-to-one initiative.

Summary of Case 2: Endor Intermediate School

The within case analysis of Endor Intermediate school detailed a rich and descriptive analysis of how a principal leads, influences and supports teachers in the implementation of a one-to-one initiative. The themes that were discussed were thirteen roles that the principal took on while leading, influencing and supporting teachers in the initiative. Twelve of the thirteen roles were outlined in the literature review of chapter 2. The twelve roles that were discussed were visionary, digital expert, manager of resources, model of technology use, technology supporter, leader of organizational, structural and policy change, leader of change in pedagogy and learning, leader of cultural change, evaluator of technology, encourager and supporter, family and community engager, and leader of ethics in technology. HR Harry was a role that was not introduced in the literature review of chapter two, but a role that was created because of the hiring and human resources work that Principal Windu had to do during the initiative. Each

of Principal Windu's thirteen roles were described from the perspective of Principal Windu and the administrative team and also from the perspective of four teachers. Each role detailed how Principal Windu took on the role during the initiative and how Principal Windu utilized the role to lead, influence and support teachers during the initiative.

During the implementation of the one-to-one initiative at Endor Intermediate School, Principal Windu took on all of the thirteen roles at some point during the initiative. There were four roles that Principal Windu took on that were significantly more important from the administrative team's perspective than any of the other nine roles. The top four roles in order of most cited were visionary, leader of change in pedagogy and learning, leader of cultural change and leader of organizational, structural and policy change. Principal Windu set a vision during the initiative that centered on teacher growth and the TPaCK model. His vision helped influence his other roles and helped to establish a school culture of no pressure. His second most cited role was the role of leader of change in pedagogy and learning. He took on the role leader of change in pedagogy and learning by communicating clear technology expectations and connecting teachers with one another. His third most cited role was the role of leader of cultural change and he played this role by creating a fun culture where there was no pressure to use technology and a culture where teachers were sharing technology ideas with one another. Another important role for Principal Windu was the role of leader of organizational, structural and policy change. Principal Windu organized many structures to help support the implementation of the one-to-one initiative, most notably the seven layers of support.

The teachers perceptions of Principal Windu's efforts to lead, support and influence teachers in the implementation of the one-to-one initiative mostly aligned with Principal Windu's

own perceptions of his leadership efforts. The teachers' perceptions of Principal Windu's most important roles were exactly the same roles as the administrative teams perceptions. The visionary was the role that the teachers felt was most important for Principal Windu's leadership of the one-to-one initiative. His vision of "being ok where you are, but moving forward" seemed to resonate with the teacher interview participants. The teachers also felt that the role of leader of change in pedagogy and learning was very important for Principal Windu. He took on this role to communicate to teachers that there were no specific technology usage expectations where teachers were expected to have their laptops out at all times. The teachers also commented on the impact that Principal Windu made by taking on the role of leader of cultural change by promoting a culture where teachers felt no pressure to use technology and a culture where teachers were encouraged to share technology ideas with one another. Endor's within case analysis outlined how Principal Windu led, supported and influenced teachers in the implementation of the one-to-one initiative and the section shared the teachers' perceptions of Principal Windu's leadership efforts. Due to the overwhelming similarities between the two cases, the following section will detail a brief summary of cross-case findings of both schools and the summary of the similarities and differences between cases.

Cross-Case Findings of Case 1 and Case 2

In the following section I will discuss the cross-case findings of Naboo Intermediate School and Endor Intermediate School and continue to answer my research questions:

1. How do principals lead teachers in the implementation of a one-to-one initiative?
    a. How do principals support teachers in the implementation of a one-to-one initiative?

b. How do principals influence teachers' use of technology in the implementation of a one-to-one initiative?

2. How do teachers perceive the principal's efforts to lead, support, and influence the teaching staff in the implementation of a one-to-one initiative?

I originally intended to conduct a comprehensive cross-case analysis of Naboo Intermediate School and Endor Intermediate School, but upon further analysis I discovered that the findings from both schools were extremely similar. I have, therefore, summarized the similarities between cases and discussed the major differences that occurred in the studies. Thus, this section will detail similarities and differences of the roles the Naboo and Endor principals took on during the implementation of the one-to-one initiative from the perspective of the principals and from the perspective of the teachers.

Cross Case Findings of Research Question One A and B

This section examines the data of Naboo Intermediate School and Endor Intermediate School through the lens of the first research question:

1. How do principals lead teachers in the implementation of a one-to-one initiative?
    a. How do principals support teachers in the implementation of a one-to-one initiative?
    b. How do principals influence teachers' use of technology in the implementation of a one-to-one initiative?

This summary of the cross case findings includes the analysis of interviews, observations, principal shadowing, documents and archival records. The same qualitative data that were analyzed in the within-case analyses were integrated into an overall case study database and

analyzed to examine whether each case replicated or contrasted the other. Table 10 provides a comparison of the principal's and assistant principals' perceptions of the roles Principal Organa and Principal Windu took on, ranked by frequency. The rankings are based on the coding totals for each role during the data analysis.

The principals in both schools took on all thirteen roles at some point during the initiative and there were many similarities with how they took on the roles to lead, support and influence the one-to-one initiative. The five most common roles that both Principal Organa and Principal Windu took on during the initiative were visionary, leader of change in pedagogy and learning,

Table 10

Rankings of the Administrators' Perceptions of Principal Organa's and Windu's Roles

Role Ranking	**Principal Organa**	**Principal Windu**
#1	Visionary	Visionary
#2	Model of Technology Use	Leader of Change in Pedagogy & Learning
#3	Leader of Change in Pedagogy & Learning	Leader of Cultural Change
#4	Encourager and Supporter	Leader of Organizational, Structural & Policy Change
#5	Leader of Organizational, Structural & Policy Change	Encourager and Supporter
#6	Leader of Cultural Change	Family and Community Engager
#7	Digital Expert	Manager of Resources
#8	HR Harriet	Evaluator of Technology
#9	Manager of Resources	Technology Supporter
#10	Technology Supporter	Digital Expert
#11	Evaluator of Technology	Leader of Ethics in Technology
#12	Family and Community Engager	Model of Technology Use
#13	Leader of Ethics in Technology	HR Harry

Note. Rankings are based on coding frequency totals for each role during data analysis.

leader of cultural change, leader of organizational, structural and policy change and encourager and supporter.

The biggest commonality between Principal Organa's and Principal Windu's leadership of the initiative was the role of visionary. While both principals had somewhat distinctive leadership styles, Principal Organa's and Principal Windu's visions both centered on teacher growth, ensuring teachers remained focused on their instruction and that the technology should support the instruction and not be the main focus. The role of leader of change in pedagogy and learning was another commonality between the leadership of Principal Organa and Principal Windu. Organa and Windu took on the role of leader of change in pedagogy and learning by communicating clear technology expectations and by connecting teachers within the school, so teachers could utilize technology to enhance student outcomes and pedagogy. The role of leader of cultural change was a key role for both Principal Organa and Principal Windu and they both built cultures that were conducive to the implementation of the one-to-one initiative. However, their cultures had marked differences such as Principal Organa's culture focused on not losingtheir relationship focus, while Principal Windu's culture had more elements of the TPaCK model and was focused on teachers sharing with one another. Despite the differences, the biggest similarity between their cultures was that Organa and Windu both built comfortable and relaxed cultures where teachers felt little pressure to use technology. Principal Organa's and Principal Windu's leadership in the role of leader of organizational, structural and policy change was similar in that they both created extensive structures for technical support, but Principal Windu established more comprehensive structures in the area of instructional support, for example, his seven layers of support. Principal Organa and Principal Windu both had to

eliminate positions and change personnel roles to best support one-to-one initiatives at their schools. Both Principal Organa and Principal Windu acknowledged the importance of the role of encourager and supporter and this role was mentioned frequently in both cases. The biggest ways that Principal Organa and Principal Windu played the role of encourager was by providing teachers with encouraging words throughout the semester. Both principals were willing to support teachers in any way possible, but Principal Windu was a little more structured in how he provided support for teachers.

The biggest difference in roles that Principal Organa and Principal Windu took on during the initiative was in the role of model technology use and family and community engager. Both principals expressed taking on the role of model of technology use during the initiative, but the role was significantly more important for Principal Organa in her influence of the one-to-one initiative. The biggest difference in their modeling was how purposeful Principal Organa and her administrative team were about modeling to their staff. Another big difference between Principal Organa's and Principal Windu's modeling during the initiative was how influential Organa's modeling was. Organa and Windu both modeled the use of the program OneNote, but Organa's modeling led to the widespread use of the program throughout her school. Both Principal Organa and Principal Windu held the role of family and community engager during the initiative and they utilized similar strategies to engage parents. Principal Windu was more thorough in his role of family and community engager and was involved in various efforts to involve and educate the parents of Endor about the one-to-one initiative because increasing family involvement was a focus for Principal Windu and his administrative team during the 2015-2016 school year. Overall, Principal Organa and Principal Windu had many similarities in

how they led, supported and influenced the initiative, which added to the validity of the study's findings.

Cross Case Findings of Research Question Two

The following section examines the qualitative data from Naboo Intermediate School and Endor Intermediate School through the lens of the second research question:

2. How do teachers perceive the principal's efforts to lead, support, and influence the teaching staff in the implementation of a one-to-one initiative?

This section combined the qualitative interview data from the six Naboo teacher interviews and the four Endor teacher interviews to form one multi-case teacher interview database. The teachers' responses were analyzed to detail a summary of cross case findings based on whether each case replicated or contrasted the other case. The comparison of the rankings of the teachers' perceptions of the roles Principal Organa and Principal Windu took on while leading, influencing and supporting the one-to-one initiative can be found in Table 11. The rankings are based on the coding totals for each role during the data analysis.

The cross case findings of the second research question involving teacher perceptions had fewer similarities than the cross case findings of the first research question. According to teachers the biggest theme between the two cases was the role of visionary that both Principal Organa and Principal Windu regularly took on during the initiative. Teachers shared that both principals' visions made teachers feel more comfortable in their approach to using one-to-one devices throughout the initiative. Teachers described differences between the visions that both principals established, but the majority of the teachers who were interviewed cited the importance of Principal Organa and Principal Windu taking on the visionary role during the

Table 11

Rankings of the Teachers' Perceptions of Principal Organa's and Windu's Roles

Role Ranking	Principal Organa	Principal Windu
#1	Model of Technology Use	Visionary
#2	Encourager and Supporter	Leader of Change in Pedagogy & Learning
#3	Visionary	Leader of Cultural Change
#4	Leader of Organizational, Structural & Policy Change	Encourager and Supporter
#5	Digital Expert	Technology Supporter
#6	Manager of Resources	Leader of Organizational, Structural & Policy Change
#7	Technology Supporter	Digital Expert
#8	Family and Community Engager	Manager of Resources
#9	Leader of Cultural Change	Evaluator of Technology
#10	Evaluator of Technology	Model of Technology Use
#11	Leader of Change in Pedagogy & Learning	Family and Community Engager
#12	Leader of Ethics in Technology	Leader of Ethics in Technology
#13	HR Harriet	HR Harry

Note. Rankings are based on coding frequency totals for each role during data analysis.

initiative. Teachers from both studies highlighted Principal Organa and Principal Windu taking on the role of encourager and supporter throughout the initiative. Both principals were positive in their encouragement of teachers and supported teachers by listening to them and their concerns. The teachers from both schools felt that this role stood out for Principal Organa and Principal Windu during the initiative and the principals played an integral role in supporting teachers through this role. Teachers from both studies acknowledged how helpful it was to have principals with technology backgrounds and principals who took on the role of digital expert and technology supporter.

From the perspective of the teachers, the role of model of technology use was one of the biggest differences in how Principal Organa and Principal Windu led, supported and influenced their school's implementation of the one-to-one initiative. Teachers believed that Principal Windu valued modeling and modeled technology once in a while during the initiative, but Principal Organa utilized the role to lead and influence the initiative in powerful ways. The most common example Naboo teachers cited was Principal Organa's modeling of the OneNote program for the staff. Teachers at Naboo did not mention the roles of leader of change and pedagogy and leader of cultural change as much as the Endor teachers, but both Naboo and Endor teacher perceptions of their principal taking on this role were fairly similar. Overall, teachers' perceptions of the roles Principal Organa and Principal Windu took on to lead, support and influence the implementation of the one-to-one had many similarities like with the cross case findings of research question one. The similarities between teachers' perceptions of both cases only further validated the overall study findings.

Chapter 4 detailed the within-case analyses of Naboo Intermediate School and Endor Intermediate School and a summary of cross-case findings between the two cases was shared. The cross case findings explained the major similarities between the cases and detailed the minor differences that were found. Chapter 5 will outline the discussions and implications of the study on how the principals led, supported and influenced the implementation of their school's one-to-one initiative.

CHAPTER 5

DISCUSSIONS, IMPLICATIONS, AND RECOMMENDATIONS

There have been multiple studies conducted on the principal's role in leading teachers' use of instructional technology in schools (Afshari, Bakar, Luan, Samah & Fooi 2009; Anderson & Dexter, 2000, 2005; Byrom & Bingham, 2001; Chang, 2012; Flanagan & Jacobsen, 2003; McGarr & Kearney, 2009; Shapley et al., 2010). However, there have been very few studies conducted on how a principal can lead, support and influence teachers, specifically in the implementation of a one-to-one initiative (Cowie, Jones & Harlow, 2011; Dexter; 2007; Hayes and Greaves, 2013). The purpose of this qualitative study was to examine how a principal can lead, support and influence the implementation of a one-to-one initiative. The study utilized an exploratory multi-site case study to answer the following research questions:

1. How do principals lead teachers in the implementation of a one-to-one initiative?
    a. How do principals support teachers in the implementation of a one-to-one initiative?
    b. How do principals influence teachers' use of technology in the implementation of a one-to-one initiative?
2. How do teachers perceive the principal's efforts to lead, support, and influence the teaching staff in the implementation of a one-to-one initiative?

The multi-site case study sought to answer the two research questions through the lens of the role identity theoretical framework. Thus, the principals' leadership efforts during the initiative were categorized into thirteen a priori roles, all or some with which the principals in this study may identify: visionary, digital expert, manager of resources, model of technology use, technology

supporter, leader or organizational, structural and policy change, leader of change in pedagogy and learning, leader of cultural change, evaluator of technology, encourager and supporter, family and community engager, leader of ethics in technology and HR Harriet or HR Harry. The study analyzed the principals' and administrative teams' perceptions of these thirteen roles as they implemented the one to one intiative and also analyzed the teachers' perceptions of the principal's leadership, support and influence in these roles during the implementation of the one-to-one initiative.

Principal Organa and Principal Windu both took on each of the thirteen roles at some point during the initiative to help lead, support and influence the implementation. Table 12 provides an overall list of the two principals', their administrative teams' and their teachers' perceptions of the roles Principal Organa and Principal Windu encompassed, ranked by

Table 12

Overall Rankings of the Principals' and Teachers' Perceptions of the Principal's Roles

Role Ranking	**Role Name**
#1	Visionary
#2	Leader of Change in Pedagogy and Learning
#3	Leader of Cultural Change
#4	Leader of Organizational, Structural & Policy Change
#5	Encourager and Supporter
#6	Model of Technology Use
#7	Manager of Resources
#8	Digital Expert
#8	Family and Community Engager
#10	Technology Supporter
#11	Evaluator of Technology
#12	Leader of Ethics in Technology
#13	HR Harriet or HR Harry

Note. Rankings are based on coding totals for each role during data analysis.

frequency. The rankings are based on the coding totals of each role during the data analysis and include all forms of qualitative data collected during the study. Table 12 details the top five most important roles of the principals during the study which were visionary, leader of change in pedagogy and learning, leader of cultural change, leader of organizational, structural and policy change and encourager and supporter. According to the study participants, the role of visionary was more important than any of the other roles and was paramount to both Principal Organa's and Principal Windu's leadership of the one-to-one initiative. This chapter will include a discussion of the findings and the implications of the study and conclude with the recommendations for research and concluding thoughts from the researcher.

Discussion

The findings from this study contribute to the field of research in principal leadership, specifically during implementation of a change, in this case, a one-to-one initiative. Findings include: successful one-to-one initiatives require a strong vision; successful one-to-one initiatives require support from all stakeholders; and successful one-to-one initiative change takes great preparation. The section will conclude by discussing how principals can support one-to-one technology through the role identity theoretical framework and discuss the Principal One-to-One Leadership (POTOL) model.

Finding 1: Successful One-to-One Initiatives Require a Strong Vision

Throughout the initiative, both principals and teacher participants consistently cited the role of visionary as the most important role a principal takes on during the implementation of a one-to-one initiative. This finding aligned with several studies that detailed the major impact a principal's technological vision has on a school (Banoglu, 2011; McGarr & Kearney, 2009;

Peck, Clausen, Vilberg, Meidl, & Murray, 2008). Whether it was one principal's vision of using "technology with a purpose" or the other principal's vision that focused on growth, both principals orchestrated the importance of establishing and communicating a clear and strong vision to the school staff. Many of the other principal roles during the initiative stemmed from the clear visions that they communicated at the beginning of the initiative and consistently communicated throughout the initiative. The findings of establishing a clear vision aligned with Dexter's (2011) study, "Perhaps the central implication of these results for technology leaders is the importance of being cognizant of the power of a technology vision and expressing that vision in a coherent fashion" (p. 185). Both principals' clear and consistent communication of their vision during their one-to-one initiatives, enabled teachers and staff members to find a common goal and direction to work towards.

The study also found that while a principal should establish a clear vision, a principal's vision should never be solely focused on technology when implementing a one-to-one initiative. A principal's vision must be bigger than just implementing one-to-one devices. The visions in the study aligned with the TPaCK model, which gives equal importance to technology, pedagogy and content knowledge. Technology was communicated as a portion of the principals' visions, but the visions of both principals remained on great instruction. The principals' visions during the initiative aligned with research that stressed the importance of a principal's vision including strong curricular and pedagogical components when leading a one-to-one initiative (Dexter, 2011). The visions of both principals resonated with the teachers and helped establish cultures where teachers felt little pressure to use technology all the time, but teachers were encouraged to use technology with a purpose. Without the pressure to use technology all the time, teachers felt

more comfortable to try new things when using technology. This culture may be why almost all of the interview participants from both schools felt that the teachers were further along in their initiative than they originally expected. Producing a vision that extends beyond implementing technology can lead to the progression of a school's instructional technology use and ultimately lead to the successful implementation of a one-to-one initiative.

Finding 2: Successful One-to-One Initiatives Require Support From All Stakeholders

The study's research questions centered on how a principal can lead, support and influence the implementation of a one-to-one initiative. However, the research questions did not focus on the assistant principals' and district's leadership, support and influence of the initiative. The qualitative data from both studies were clear in that successful one-to-one initiatives require support from all stakeholders, including assistant principals and the district.

Both principals relied heavily on their administrative teams to lead the initiative. Both schools had a team approach, evidenced by the principals and assistant principals saying "we" in interviews when talking about the leadership of the initiative and was just as common for teachers to say "they" when talking about the leadership of the initiative. Participants' frequent use of the words "we" and "they" confirmed the fact that the administration was often seen as a team and that the teachers didn't just look to the head principal for leadership and support during the initiative. The team approach taken by both principals aligned with the findings of researchers who stressed the importance of taking a team approach with school technology leadership (Cowie, Jones & Harlow, 2011; Dexter, 2007, 2011). Both principals constantly reemphasized the importance of the work and contributions of their administrative teams when leading the initiative.

The principals in both schools held several roles at some point during the initiative, but they were both quick to acknowledge that they assigned and delegated various responsibilities to their assistant principals and technology coordinators during the initiative. Both principals relied heavily on their assistant principals and technology coordinators to act as TPaCK coaches to help teachers utilize technology to enhance student outcomes and pedagogy. By taking on the duties of a TPaCK coach, the administrative team members took on the role of leader of change of pedagogy and learning. At one school the assistant principals took on the role of technology supporter and digital expert to help support teachers use of technology, whereas the at the other school the assistant principals dealt with various technology disciplinary issues and took on the role of leader of ethics in technology more frequently. The roles assigned to the assistant principal depended on the principal's roles and their approach to the initiative. Participants in the study viewed the team approach as influential and one assistant principal reported that the team approach was the most powerful decision his principal made to make the initiative a success.

In addition to the principals' reliance on the administrative team to help lead the one-to-one initiative, the district played an integral part in supporting the principals' leadership of the initiative as well. The district made many improvements before the initiative began to help support the principals' leadership of the one-to-one initiative. The district played a key part in helping lay the foundation for each school by building a sound wireless infrastructure in each school and through distributing the one-to-one devices to the students. By laying the foundation, the district ensured that principals did not have to take on the role of leader of infrastructure change. The district also provided the teachers with high quality professional development,

which aligned with research that found that high quality professional development is integral to the successful integration of instructional technology (Cakir, 2012; Flanagan & Jacobsen, 2003; Gerard et al. 2008; Yee, 2000). The principals from each study worked closely with the superintendent and the one-to-one initiative director to lead the implementations of the one-to-one initiative. The study confirmed that the more a district can lay the groundwork for implementation the more likely a principal will be successful when leading their school's one-to-one initiative.

Finding 3: Successful One-to-One Initiative Change Takes Great Preparation

The district and principals in the study went to great lengths to prepare for the implementation of the one-to-one initiatives before the initiatives began. The schools and the district did not implement their initiatives too quickly, which ultimately helped support teachers and principals during the initiative. The district's slower approach to implementing the initiative allowed the district to better prepare and adequately research successful one-to-one initiatives and create a comprehensive district implementation plan. Most initiatives have some version of an implementation plan to help their one-to-one initiative to be successful (Penuel, 2006; Zucker, 2004). The well thought out district approach allowed the district to implement a variety of programs and school visits that influenced the principal's leadership of the one-to-one initiative, most notably the Early Adopter program and the early introduction of the TPaCK and SAMR technology models.

The Early Adopter program impacted principals and teachers in so many ways that the program was referred to frequently during the initiative. The Early Adopter program gave twelve to fifteen teachers at each school the opportunity to implement the one-to-one devices one year

early in their classroom. This program allowed the principals and staff to get a glimpse of what the reality of life with one-to-one devices would look like. In the words of one principal, the Early Adopter program was "critical" to the implementation of the one-to-one initiative. Both teachers and administrators celebrated the lessons learned from the Early Adopter program. Teachers saw first-hand what their co-workers were going through during the Early Adopter year and this made teachers feel more comfortable with the idea of the one-to-one implementation. The Early Adopter program also provided teachers with multiple Early Adopter experts to whom they could go during the initiative for questions regarding the devices. The Early Adopter year also taught the principals important lessons they could apply in their leadership of their school's one-to-one initiative, such as, "don't let the device take over" and to encourage teachers to put the devices away if they were getting in the way of instruction. One of the principal respondents also met with the Early Adopters at the end of their first year and from this meeting he created the seven layers of support and the instructional meetings for the first year of the initiative. The Early Adopter program wouldn't have been possible without the districts well thought out and slower moving implementation plan.

The district's slower adoption process of the one-to-one initiative not only enabled the district to research and prepare for the initiative, it also helped the district to better train and prepare principals and teachers for the initiative. Gerard, Bowyer and Linn's study (2008) discovered that 92% of the principals he researched felt that professional development was integral to the effective implementation of technology. Zucker and Light's (2009) study claimed that principals need to be trained and supported, just like teachers. The principals were a part of various committees and meetings leading up to the implementation of the one-to-one initiative.

In one of the meetings they were introduced to the TPaCK and SAMR technology integration models. The TPaCK model specifically was a very influential model for both principals. The TPaCK model heavily guided one principal's vision for the implementation of the one-to-one initiative and helped him "frame the conversation about not letting the technology change our classroom," as well as persuading him to understand that simply using technology was not the sole focus of the one-to-one initiative.

The longer implementation plan also allowed principals and other administrative team members to visit Mooresville District in North Carolina, a district that had already implemented a one-to-one initiative. The Mooresville district utilized their one-to-one initiative to improve test scores, close achievement gaps, and improve graduation rates (Schwarz, 2012). The school visit allowed Principal Organa and Principal Windu to see a successful one-to-one initiative in action which impacted their leadership approach to the initiative. One principal believed wholeheartedly that visiting the Mooresville school district was imperative to his successful leadership during the initiative.

As I interviewed and shadowed principals as well as observed various meetings across the school, I realized that much of the principal leadership of the one-to-one initiatives was complete before the initiatives began. When I asked interview participants whether principal leadership in preparation for the initiative was more important than the leadership during the initiative, one principal responded that the leadership before the initiative began and leadership during the initiative were both important, but that you need have a "sense of urgency" about putting structures in place before the initiative begins to help support the implementation. Both principals had this sense of urgency as many elements were put in place before the initiative

began. Principal Organa took on several leadership roles before the initiative began, created a clear vision for the initiative, made the decision to purposefully model technology programs during the initiative, changed personnel roles to best support the initiative, established a Help Desk with a full time technology teaching assistant and technology support teacher, created a positive culture and hired thirteen new teachers. Principal Windu set a clear technology vision, created the seven layers of support to provide teachers with technology and instructional support, established instructional support meetings, focused open classroom observations on technology, adjusted the focus of the technology coordinator and created the "Super Six." These examples orchestrate the importance of principal leadership and preparation before a one-to-one initiative begins. Without the preparation of both the district and the principals, the initiatives wouldn't have been as successful at each school.

Role Identity Framework

The identity theory was the framework used to analyze and interpret the qualitative data from the study. Throughout the study the roles that principals took on were influenced by the expectations placed on them by their social environment (Stryker & Burke, 2000) or, in these cases, the school. Most distinctly, the principal's roles were influenced heavily by the principal's own self-identity. Both principals were more apt to take on roles that aligned with their self-identities. One principal identified as the "face" of the school and thus she often took on roles that aligned with that identity. Roles like visionary, model of technology use, and encourager and supporter allowed her to be the "face" of the school and the "face" of the initiative. The other principal led more from "behind the scenes" and self-identified as a person that led by putting structures in place. This principal's self-identity meant that he was more

likely to take on roles like leader of change in pedagogy and learning, leader of cultural change and leader or organizational, structure and policy change where he could establish structures and supports to lead the initiative.

While both principals led their overall one-to-one initiatives in similar ways, the roles of the principals were influenced by their prominence and salience hierarchies, which may also explain why principals took on certain roles more consistently than others. The prominence hierarchy focuses on what an individual values (Stets and Burke, 2000). Principal Organa valued the role of model of technology more than many other roles, thus her prominence hierarchy influenced her decision to take on this role more frequently during the initiative. During the initiative, the principals constantly weighed their prominence and salience hierarchies to determine roles. Principal Windu valued a teacher's use of technology in a lesson, but felt that it was not more important than a teacher's pedagogy and content knowledge. Because of this value, the principal regularly took on the role of visionary to proclaim his vision and this role was one of the highest roles in the principal's prominence hierarchy. The salience hierarchy refers to how a person will likely behave in a particular situation (Stets and Burke, 2000). Stryker and Burke (2000) believed certain identities could be more salient at any moment in time and have more power and significance than others. While the principals' self-identity and prominence hierarchy heavily influenced the roles they took on during the initiative, there were particular times where particular roles were more salient than others. Both principals were fairly proficient with technology and established various technology support structures for the initiative. However, if a technical problem arose for a teacher and the teacher was needing help, it was not uncommon for the principals to take on the role of technology supporter because at

that moment the technology supporter role was the most salient. Throughout the initiative, the principals were constantly attuned to their prominence and salience hierarchies and self-identity to identify which role to take on.

Identity congruence is attained if a person's behavior aligns with their identity. Identity congruence can lead to positive emotions and increased self-efficacy about one's performance (Stryker & Burke, 2000). Both principals seemed to achieve identity congruence at various points of the initiative. One principal identified as a model for teachers and she frequently took on the role of model of technology use, which helped her to achieve identity congruence because her behaviors aligned with her identity. The other principal identified as a structured person and he took on the role of leader of organizational, structural and policy change by establishing the seven layers of technology support among other structures. His behaviors were well received by teachers and aligned with his identity and helped him to attain identity congruence, which led to an increase in his self-efficacy.

The study's alignment with the identity theory supports and broadens our understanding of the theory. Districts need to be aware of a principal's self-identity, prominence hierarchy, and salience hierarchy when hiring in order to hire the right person to lead a school's one-to-one initiative. Most importantly principals must also be keenly aware of their self-identity, personal prominence hierarchy and salience hierarchy so they can comprehend what roles they will be inclined to take on during the implementation of a one-to-one initiative. The more attentive a principal is of his or her self-identity, the more likely they will be in achieving identity congruence, positive emotions and greater self-efficacy when leading a one-to-one initiative.

This awareness of both the district and the principal could lead to a better chance of successfully implementing a one-to-one initiative.

The Principal One-to-One Leadership (POTOL) Model

In Chapter 2, I identified the twelve roles of instructional technology leadership through a review of relevant literature. These roles include: visionary, digital expert, manager of resources, model of technology use, technology supporter, leader or organizational, structural and policy change, leader of change in pedagogy and learning, leader of cultural change, evaluator of technology, encourager and supporter, family and community engager, leader of ethics in technology. During the data analysis, the data collected helped confirm the validity of the twelve roles that I had previously identified in the literature. Moreover, the data also helped me to add the thirteenth role of HR Harriet or HR Harry. Throughout the study the thirteen roles proved to be a viable framework that helped the study participants to more specifically reflect and categorize the principal's leadership efforts.

Because of the usefulness of the thirteen roles throughout the study, the impact of the study's findings and the influence of the principal's identity, I have developed the Principal One-to-One Leadership (POTOL) Model that is outlined in Figure 2. The model illustrates how the principal's vision, support and preparation interact with the twelve other roles and how the principal's identity influences all facets of the model. The model is outlined in the symbol of a compass because the principal's identity, various roles a principal takes on and a principal's vision, support and preparation help provide the direction and leadership of a one-to-one initiative. Outlined in the very center of the compass is the word "vision" because at the center of the leadership of a one-to-one initiative lies a principal's vision for the initiative. This vision

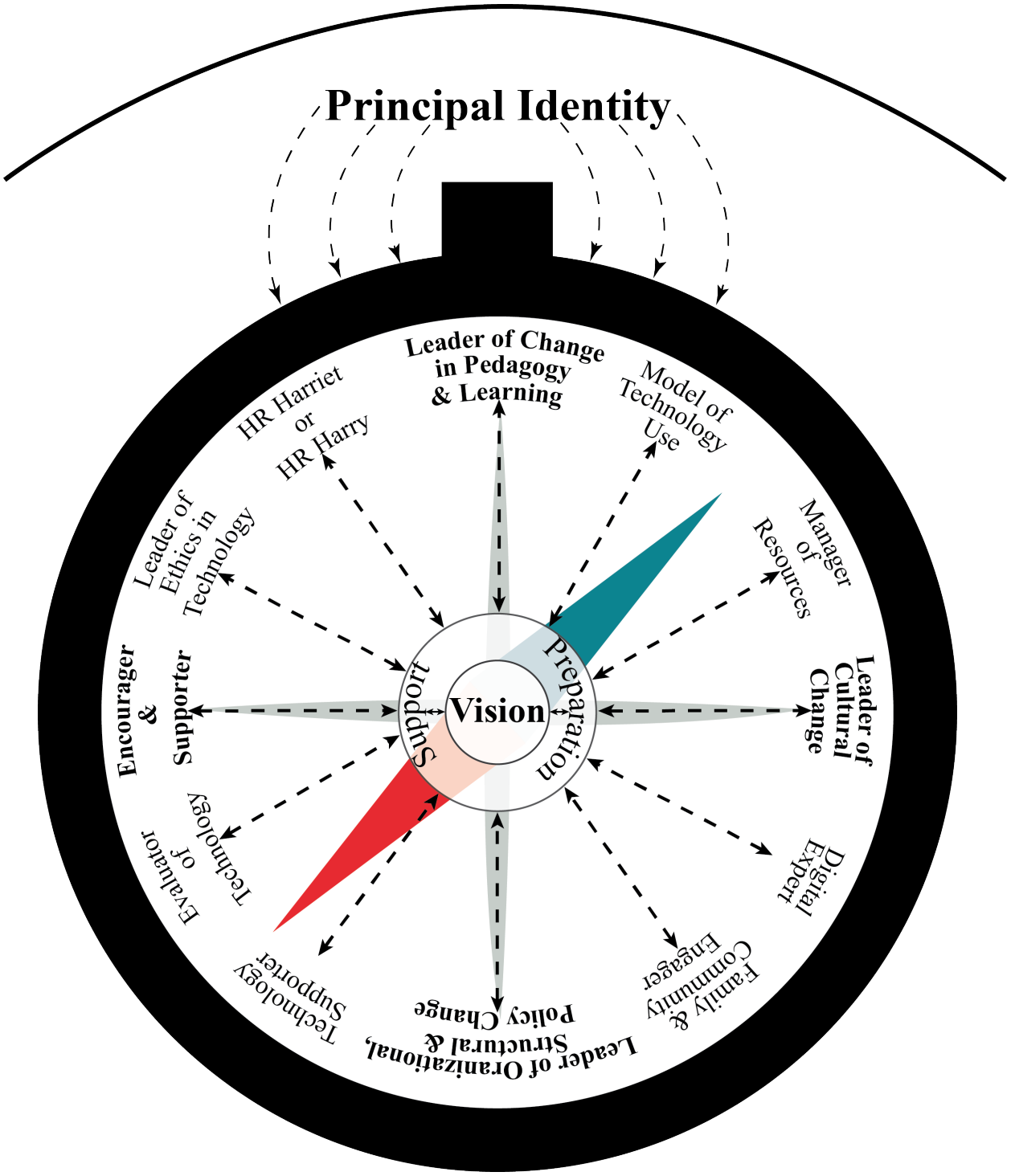

Figure 2: The Principal One-to-One Leadership (POTOL) Model

influences the overall leadership of the initiative and the other twelve roles that the principal may take on. Surrounding the vision at the center are the words "support" and "preparation." The word "support" stands for the support that a principal needs from various stakeholders, including the assistant principals and district, to make a one-to-one initiative successful. The word "preparation" symbolizes the principal's and district's preparation before the initiative begins that is necessary to make the initiative successful. On the outermost circle of the compass are the roles that a principal may take on to lead, influence and support a one-to-one initiative. The most frequently cited roles are located at the north, south, east and west points of the model and are in bold text to highlight their importance. Above the compass is the principal's identity, which has the biggest influence on the roles the principal takes on during the initiative.

The model acts as an analogy and demonstrates how a principal's identity is similar to how the earth's magnetic field works with a compass. On a compass, the earth's north pole attracts the needle of the compass to show which way is north. In the model the principal's identity helps influence which role the principal will take on at different points of the initiative and helps provide the principal with the leadership direction and always shows the principal which way is "north." The one way arrows from the principal's identity to the compass show how the principal's identity influences the compass, but how the roles, vision, support and preparation do not influence the principal's identity. Furthermore, the arrows from the center of the compass to the twelve roles go in both directions. This is because the principal's vision, support and preparation influence the roles he or she takes on, but the roles also influence the principal's vision, support and preparation during the initiative. Like a compass, the roles a

principal takes on move freely during the initiative, however the vision always stays central to the leadership of the initiative. The POTOL model is intended for policymakers, districts, principals, teachers and researchers and can help them identify the various facets of successfully leading a one-to-one initiative and how the facets of the model interact with and influence one another.

Implications of the Study

The findings from the study have implications for principals and districts who are considering the implementation of a one-to-one initiative. Implications for both principals and district personnel are considered.

A district's and principal's preparation of a one-to-one initiative before the initiative ever begins cannot be underestimated. School districts must prepare schools and principals for the one-to-one initiative far in advance of its implementation. The implications of this are that districts are encouraged to consider a slower implementation process as it helps provide the district and the schools with additional preparation time to research one-to-one initiative best practices and more time to be thoughtful when creating an implementation plan for the district. This slower adoption process greatly influenced the principals' leadership of the one-to-one initiative because it allowed the district to roll out the highly effective Early Adopter Plan, expose the principals to the TPaCK and SAMR models and allow staff members to visit other districts that had already implemented one-to-one initiatives. Schools and Districts are not only encouraged to not rush their one-to-one implementation plans, but schools and districts also are encouraged to expose their staffs to various technology integration models, allow people from their district or school to visit successful one-to-one districts like Mooresville and to consider

creating a trial year similar to the Early Adopter program. Sadly, at the school level, some administrators have ignored the importance of preparation in the leadership of an initiative, and approached the adoption of technology in their schools by thinking that all they have to do is buy computers for their teachers and students to improve teachers' pedagogical practices (Afshari et al., 2009). However, only buying and installing computers and networks does not lead to major educational reform or changes in instructional approaches (Cuban et. al, 2001). Both principals in the study seemed to understand the importance of planning for the initiative and that the real work of the initiative happens before the initiative ever begins.

The study's findings also have implications for the vision a principal must establish when leading a one-to-one initiative. Principals must have a clear and concise vision that is communicated to all stakeholders. A clear vision is central to a principal's leadership of an initiative and principal must establish their vision before the initiative ever begins and continually communicate this vision as the initiative progresses. The vision and the communication of the vision may be the most important leadership action a principal takes when leading the implementation of a one-to-one initiative. Districts and principals should also consider not making their initiative center on the use of the technology and be careful about putting any pressure or expectations of technology use on teachers. The messages that principals in the study communicated made technology a piece of the instruction, but not the center and focus of their approach and the progress of the initiative at each school seemed to confirm the effectiveness of the approach. This approach may seem contrary to the focus of a one-to-one initiative, but study participants specifically warned about having an approach that forced teachers to use technology during the initiative. When a principal makes the vision of a one-to-

one initiative about more than technology, teachers can feel more comfortable to try new things and more effectively utilize technology in their classrooms.

Principals must prepare stakeholders and the school for the successful enactment of the vision. Before a one-to-one initiative officially commences, a principal must have a clear vision and think exhaustively of what structures they must put in place to make their vision a reality. This includes support structures that must be put in place, personnel role changes that must be made and meetings and groups that must be established. These structures are a major part in helping a principal's vision become to reality. A principal's leadership during a one-to-one initiative is almost as important as a principal's leadership before a one-to-one initiative, but a principal can harm their leadership efforts if they don't make the right leadership decisions before an initiative begins.

The leadership of a one-to-one initiative is a massive undertaking and implication for practice is that principals simply can't lead the implementation of a one-to-one initiative on their own. Principals can support a change initiative by engaging the support of others. Principals from the study utilized their assistant principals, technology coordinators and the support of the district to lead, influence and support their initiatives. It is difficult to comprehend one principal creating a vision, preparing for the implementation of an initiative and taking on all of the roles adequately to lead a one-to-one initiative on their own, thus it is crucial that a principal honestly reflects on their own personal leadership strengths and weaknesses and utilizes the strengths of the people and resources around them to lead such a large implementation. A principal must choose which of the roles they are going to deliberately take on during an initiative and then delegate or assign the other roles to administrative team members and think of ways the district

can support the principal in certain roles and ask for help from the district if necessary. Dexter's (2007, 2011) research aligned with this recommended team approach by believing that a team of people should share technology decision-making responsibilities.

Policymakers, school districts and principals should consider utilizing the Principal One-to-One Leadership model in the implementation of a one-to-one initiative to ensure that all principal roles are considered, that a proper vision has been communicated and that adequate support and preparation have been provided. Districts and principals can evaluate their preparedness by identifying their principal's identity to determine which roles the principal may take on more than others. The model can also act as reflective tool for principals who are in the midst of implementing a one-to-one initiative. The principals can evaluate their vision, support and preparation for the initiative, what roles they have taken on thus far and which roles they need to take on more in the future. The principals can identify how their vision, support and preparation is influencing the roles they take on and also consider how the various roles are influencing the principal's vision, support and preparation. The roles helped principals in the study to go deeper in their reflection of their leadership efforts and the model is intended to help future principals reflect, prepare and more effectively lead the implementation of their one-to-one initiatives.

Recommendations for Research

This study sought to understand how principals lead, support and influence teachers in the implementation of a one-to-one initiative. Although research has been conducted on one-to-one initiatives and the principal leadership of instructional technology, there are only a few research studies conducted on how a principal specifically leads a one-to-one initiative (Cowie,

Jones & Harlow, 2011; Dexter; 2007; Hayes and Greaves, 2013). While this study added to the research on principal leadership of one-to-one initiatives, more research is needed to better understand the phenomenon.

The Lake District is one of the highest performing and highest salaried districts in the state of Tennessee. The student body of Naboo Intermediate School and Endor Intermediate School were fairly affluent and very high achieving schools. The Lake District's one-to-one initiative was not introduced to help grow test scores or improve struggling schools, but for other reasons. This is a different reality than many schools experience when implementing a one-to-one initiative as most schools have the goal of transforming the quality of instruction to improve educational practices and academic achievement (Valiente, 2010). Schools may implement one-to-one devices to improve test scores or to help improve learning in high poverty schools. A similar study of high poverty, low performing schools may be valuable.

This case study provided a rich and thick descriptive study of how principals lead, support and influence teachers in the implementation of a one-to-one initiative, but additional quantitative studies might extend the reach where qualitative studies might not. The findings from this study could form the basis for a survey that could be validated and tested. The results from the survey could help support the findings from this study and add any new additional details. The survey results could further guide the leadership efforts of principals and districts who are considering implementing one-to-one initiatives. The survey could also be used by districts along with the POTOL model for recruiting and hiring principals to lead an initiative like this.

Another implication for research relates to the assistant principal's role in the leadership, support and influence of an implementation of a one-to-one initiative. The importance of the assistant principal's leadership of a one-to-one initiative quickly became evident during data collection in this study. There is scant research that targets an assistant principal's leadership of a one-to-one initiative. Studies on an assistant principal's role in leading a one-to-one initiative would be a valuable contribution to the literature.

While the study specifically focused on the principal's leadership of the implementation of a one-to-one initiative, findings from this study could be utilized to guide the research of future change initiatives. The POTOL model and the importance of a principal's vision, support and preparation in a one-to-one initiative could help guide the research of any future instructional technology initiatives and even influence overall change initiatives that don't relate to technology.

Concluding Thoughts

As we continue to journey more deeply into a world filled with technology, one-to-one initiatives continue to grow in popularity in schools across the world (Cowie, Jones, Harlow, Forret, McGee & Miller, 2008; Hew & Brush, 2007; Jaillet, 2004; Newhouse & Rennie, 2001; Sclater, Sicoly, Abrami & Wade, 2006; Valiente, 2010; Zucker & Light, 2009). As schools and districts adopt one-to-one initiatives, principals are being asked to lead the implementation of these one-to-initiatives. While some studies have found that principal technological leadership correlates with a teaching staff's integration of technology (Anderson & Dexter, 2005; Chang, 2012; Shapley et al., 2010), there is very little research that has been conducted on how a principal leads a one-to-one initiative (Cowie, Jones & Harlow, 2011; Dexter; 2007; Hayes and

Greaves, 2013). This can be a daunting position for a school principal because few educational initiatives have been as costly as one-to-one initiatives (Holcomb, 2009) and with the investment of money comes great expectations.

The aim of this study was to provide principals and districts with strategies for a successful implementation of a one-to-one initiative. I am confident that by presenting how the principals led, supported and influenced their school's one-to-one initiative through the the lens of the identity framework, this will help provide a narrative for principals and districts who are considering implementing a one-to-one initiative. I am also hopeful that the POTOL model will serve as a guide for districts and principals who are considering taking on this massive endeavor in the future.

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APPENDICES

Appendix A

Principal Interview Protocol

The purpose of this study is to examine how principals successfully lead, support and influence the implementation of a one-to-one initiative. I will ask you about how you lead, influence and support your initiative and ask for you to share the roles you play in your leadership of your school's one-to-one initiative. For the purposes of this study and interview, the term instructional technology will be used to indicate educational technology and Information Communication Technologies.

Background with Instructional Technology

1. Tell me about your background in education and as a principal [a].
2. Tell me about your experience with instructional technology [a].
    a. Have you had any history in leading teachers in the integration of instructional technology [a]?
3. How proficient do you believe you are at helping teachers use instructional technology in the classroom? Explain your reasoning.
4. What does successfully implementing technology in the classroom mean to you?

Leading a One-to-One Initiative

5. How did you feel/react when you heard your school was adopting a one-to-one initiative[a]?
    a. Did you have any concerns [a]?
6. How important do you believe a principal's role is in implementing a one-to-one initiative?

a. How so?

7. How does instructional technology relate to your school's goals and what is your vision for how this 1:1 initiative will affect instruction in the future?
    a. Did your school's goals, vision and mission get revised in any way once your school learned they were adopting a 1:1 initiative?
8. How has the district assisted you in preparing as a leader to help implement this 1:1 initiative at your school? How have you personally prepared to help implement this one-to-one initiative at your school?
9. Tell me about some of the things you have done to help **lead** your teachers in the implementation of your school's one-to-one initiative.
10. What have been some things you have done to **support** your teachers in the integration of your school's one-to-one implementation?
11. What are some ways you have tried to **influence** your teachers' use of instructional technology during this one-to-one implementation?
12. I am going to read a list of roles that a principal might take in leading a 1:1 initiative. Which of these roles describe how you have led this initiative? Give me an example of how you led or influenced the initiative in this role.
    a. Visionary
    b. Digital Experts
    c. Model Technology Users
    d. Managers of Resources
    e. Technology Support

f. Leader of infrastructure change
    i. Leader of organizational and policy change
    ii. Leader of change and pedagogy and learning
    iii. Leader of cultural change
g. Evaluator of technology
h. Encourager and Supporter
i. Family and Community Engager
j. Leader of ethics in technology
    i. The digital divide
    ii. Digital Citizenship
    iii. Privacy, security and online leaders

Reflecting on your leadership efforts

13. Talk to me about the biggest challenges and setbacks of leading, supporting and influencing this initiative?
    a. What have you learned from these setbacks?
    b. Will you do anything differently moving forward?
14. You have explained to me some of the things you have done to help lead, support and influence your teachers in your initiative. Which of these do you feel have been the most successful in leading, supporting and influencing your teachers in the implementation of your school's one-to-one initiative?
    a. Why do you believe these things have been successful?

15. What do you think are the most important things you need to do as a school principal leading a 1:1 initiative?
16. How as a principal do you ensure that your teachers are using their one-to-one technology to positively impact their instruction and student learning?
17. What type of professional development related to your 1:1 initiative is provided for teachers at a district-level? At a school-level? What is your involvement with the professional development?
18. How do feel you have done as the school's instructional leader in this one-to-one implementation so far?
19. What type of advice would you give to other principals who are implementing a one-to-one initiative in the future?
20. Is there anything else you would like to share about leading, supporting and influencing the implementation of your school's one-to-one initiative?

[a] Question is asked only on the first of the three interviews.

Appendix B

Assistant Principal Interview Protocol

The purpose of this study is to examine how school principals successfully lead, support and influence the implementation of a one-to-one initiative. I will ask you about how you lead, influence and support your initiative and ask for you to share the roles you play in your leadership of your school's one-to-one initiative. I will also ask about your perceptions of your principals efforts in leading, supporting and influencing the implementation of your school's one-to-one initiative. For the purposes of this study and interview, the term instructional technology will be used to indicate educational technology and Information Communication Technologies.

Background with Instructional Technology

1. Tell me about your background in education and background as an assistant principal [a].
2. Tell me about your experience with instructional technology [a].
    a. Have you had any history in leading teachers in the integration of instructional technology [a]?
3. How proficient do you believe you are at helping teachers use instructional technology in the classroom? Explain your reasoning.
4. What does successfully implementing technology in the classroom mean to you?

Leading a One-to-One Initiative

5. How did you feel/react when you heard your school was adopting a one-to-one initiative[a]?
    a. Did you have any concerns [a]?

6. How important do you believe a principal's role is in implementing a one-to-one initiative? How so?
    a. How important do you believe an assistant principal's role is in implementing a one-to-one initiative? How so?
    b. How do you see these two roles complementing one another?
7. How does instructional technology relate to your school's goals and what is your principal's vision for how this 1:1 initiative will affect instruction in the future?
    a. Did your school's goals, vision and mission get revised in any way once your school learned they were adopting a 1:1 initiative?
8. How has the district assisted you in preparing as a leader to help implement this 1:1 initiative at your school? How have you personally prepared to help implement this one-to-one initiative at your school?
9. Tell me about some of the things you have done to help **lead** your teachers in the implementation of your school's one-to-one initiative.
10. What have been some things you have done to **support** your teachers in the integration of your school's one-to-one implementation?
11. What are some ways you have tried to **influence** your teachers' use of instructional technology during this one-to-one implementation?
12. I am going to read a list of roles that a principal might take in leading a 1:1 initiative. Which of these roles describe how your principal has led this initiative? Give me an example of how you led or influenced the initiative in this role.
    a. Visionary

b. Digital Experts

c. Model Technology Users

d. Managers of Resources

e. Technology Support

f. Leader of infrastructure change

    i. Leader of organizational and policy change

    ii. Leader of change and pedagogy and learning

    iii. Leader of cultural change

g. Evaluator of technology

h. Encourager and Supporter

i. Family and Community Engager

j. Leader of ethics in technology

    i. The digital divide

    ii. Digital Citizenship

    iii. Privacy, security and online leaders

Reflecting on your leadership efforts

13. Talk to me about the biggest challenges and setbacks of leading, supporting and influencing this initiative?

    a. What have you learned from these setbacks?

    b. Will you do anything differently moving forward?

14. You have explained to me some of the things you have done to help lead, support and influence your teachers in your initiative. Which of these do you feel have been the most

successful in leading, supporting and influencing your teachers in the implementation of your school's one-to-one initiative?

15. What do you think are the most important things a school assistant principal should do when leading a 1:1 initiative?
16. How as an assistant principal do you ensure that your teachers are using their one-to-one technology to positively impact their instruction and student learning?
17. What type of professional development related to your 1:1 initiative is provided for teachers at a district-level? At a school-level? What is your involvement with the professional development?
18. How do feel you have done as the school's instructional leader in this one-to-one implementation so far?
19. What type of advice would you give to other principals who are implementing a one-to-one initiative in the future?

Reflecting on Your Principal's Leadership Efforts

20. What type of support regarding your school's 1:1 initiative would you like to see your principal provide in the future?
21. How important is an assistant principal's role in leading, influencing and supporting the implementation of a 1:1 initiative?
22. How involved have you been in helping lead, influence and support the implementation of your school's 1:1 initiative?
23. What responsibilities has your principal given you in helping lead, influence and support the implementation of your school's 1:1 initiative?

24. Are there any things you feel like your principal should do differently in the future in order to successfully lead, influence and support the implementation of your school's one-to-one initiative?
25. Is there anything else you would like to share about how your principal has led, supported and influenced the implementation of your school's one-to-one initiative?

[a] Question is asked only on the first of the three interviews.

Appendix C

Curriculum Coach Interview Protocol

The purpose of this study is to examine how school principals successfully lead, support and influence the implementation of a one-to-one initiative. The interview questions will ask about your perceptions of your principals efforts in leading, supporting and influencing the implementation of your school's one-to-one initiative. For the purposes of this study and interview, the term instructional technology will be used to indicate educational technology and Information Communication Technologies.

Background with Instructional Technology

1. Tell me about your background in education and background as a curriculum coach [b].
2. Tell me about your experience with instructional technology [b].
    a. Have you had any history in leading teachers in the integration of instructional technology [b]?
3. How proficient do you believe you are at helping teachers use instructional technology in the classroom? Explain your reasoning.
4. What does successfully implementing technology in the classroom mean to you?

Leading a One-to-One Initiative

5. How did you feel/react when you heard your school was adopting a one-to-one initiative [b]?
    a. Did you have any concerns [b]?
6. How important do you believe a principal's role is in implementing a one-to-one initiative? How so?

a. How important do you believe a curriculum coaches' role is in implementing a one-to-one initiative? How so?

b. How do you see these two roles complementing one another?

7. How does instructional technology relate to your school's goals and what is your principal's vision for how this 1:1 initiative will affect instruction in the future?

    a. Did your school's goals, vision and mission get revised in any way once your school learned they were adopting a 1:1 initiative?

8. How has the district assisted you in preparing as a curriculum coach to help implement this 1:1 initiative at your school? How have you personally prepared to help implement this one-to-one initiative at your school?

9. Tell me about some of the things your principal has done to help **lead** your teachers in the implementation of your school's one-to-one initiative.

10. What have been some things your principal has done to **support** your teachers in the integration of your school's one-to-one implementation?

11. What are some ways your principal has tried to **influence** your teachers' use of instructional technology during this one-to-one implementation?

12. I am going to read a list of roles that a principal might take in leading a 1:1 initiative. Which of these roles describe how your principal has led this initiative? Give me an example of how they led or influenced the initiative in this role.

    a. Visionary

    b. Digital Experts

    c. Model Technology Users

d. Managers of Resources

e. Technology Support

f. Leader of infrastructure change

    i. Leader of organizational and policy change

    ii. Leader of change and pedagogy and learning

    iii. Leader of cultural change

g. Evaluator of technology

h. Encourager and Supporter

i. Family and Community Engager

j. Leader of ethics in technology

    i. The digital divide

    ii. Digital Citizenship

    iii. Privacy, security and online leaders

Reflecting on your Principal's Leadership efforts

13. Talk to me about the biggest challenges and setbacks of leading, supporting and influencing this initiative your principal has faced.

    a. What have you learned from these setbacks?

    b. Will you do anything differently moving forward?

14. You have explained to me some of the things your principal has done to help lead, support and influence your teachers in your initiative. Which of these do you feel have been the most successful in leading, supporting and influencing your teachers in the implementation of your school's one-to-one initiative?

15. What do you think are the most important things a school principal should do when leading a 1:1 initiative?
16. How has your principal ensured that your teachers are using their one-to-one technology to positively impact their instruction and student learning?
17. What type of professional development related to your 1:1 initiative is provided for teachers at a district-level? At a school-level? What is your involvement with the professional development?
18. How do feel your principal has done as the school's instructional leader in this one-to-one implementation so far?
19. What type of support regarding your school's 1:1 initiative would you like to see your principal provide in the future?
20. How important is a principal's role in leading, influencing and supporting the implementation of a 1:1 initiative?
21. How involved have you been in helping lead, influence and support the implementation of your school's 1:1 initiative?
22. What responsibilities has your principal given you in helping lead, influence and support the implementation of your school's 1:1 initiative?
23. Are there any things you feel like your principal should do differently in the future in order to successfully lead, influence and support the implementation of your school's one-to-one initiative?
24. Is there anything else you would like to share about how your principal has led, supported and influenced the implementation of your school's one-to-one initiative?

[b] Question is asked only on the first of the two interviews.

Appendix D

Teacher Interview Protocol

The purpose of this study is to examine how principals successfully lead, support and influence the implementation of a one-to-one initiative. The interview questions will ask about your perceptions of your principals efforts in leading, supporting and influencing the implementation of your school's one-to-one initiative.

1. Tell me about your background in education and background as a teacher.
2. Tell me specific details about your past experience with instructional technology and how you have integrated it in your classroom.
3. How proficient do you believe you are at using instructional technology in the classroom? Explain your reasoning.
4. What does successfully implementing technology in the classroom mean to you?

Your One-to-One Initiative

5. How did you feel/react when you heard your school was adopting a one-to-one initiative?
    a. Did you have any concerns?
6. How important do you believe a principal's role is in implementing a one-to-one initiative?
    a. How so?
7. How does instructional technology relate to your school's goals and what is your principal's vision for how this 1:1 initiative will affect instruction in the future?
    a. Did your school's goals, vision and mission get revised in any way once your school learned they were adopting a 1:1 initiative?

8. How did you prepare and how has the district helped you prepare as a teacher to help you effectively integrate one-to-one technology in your classroom?
9. Tell me about some of the things your principal has done to help **lead** you and other teachers in the implementation of your school's one-to-one initiative.
10. What have been some things your principal has done to **support** you and other teachers in the integration of your school's one-to-one implementation?
11. What are some ways your principal has tried to **influence** you and other teachers use of instructional technology during this one-to-one implementation?
12. I am going to read a list of roles that a principal might take in leading a 1:1 initiative. Which of these roles describe how your principal has led this initiative? Give me an example of how they led or influenced the initiative in this role.
    a. Visionary
    b. Digital Experts
    c. Model Technology Users
    d. Managers of Resources
    e. Technology Support
    f. Leader of infrastructure change
        i. Leader of organizational and policy change
        ii. Leader of change and pedagogy and learning
        iii. Leader of cultural change
    g. Evaluator of technology
    h. Encourager and Supporter

i. Family and Community Engager

j. Leader of ethics in technology

i. The digital divide

ii. Digital Citizenship

iii. Privacy, security and online leaders

13. Talk to me about the biggest challenges and setbacks of leading, supporting and influencing this initiative your principal has faced.
    a. What have you learned from these setbacks?
    b. Will you do anything differently moving forward?
14. You have explained to me some of the things your principal has done to help lead, support and influence your teachers in your initiative. Which of these do you feel have been the most successful in leading, supporting and influencing your teachers in the implementation of your school's one-to-one initiative?
15. What do you think are the most important things a school principal should do when leading a 1:1 initiative?
16. How has your principal ensured that your teachers are using their one-to-one technology to positively impact their instruction and student learning?
17. What type of professional development related to your 1:1 initiative is provided for teachers at a district-level? At a school-level? What has been your principal's involvement with the professional development?
18. How do feel your principal has done as the school's instructional leader in this one-to-one implementation so far?

19. What type of support regarding your school's 1:1 initiative would you like to see your principal provide in the future?
20. How important is a principal's role in leading, influencing and supporting the implementation of a 1:1 initiative?
21. Are there any things you feel like your principal should do differently in the future in order to successfully lead, influence and support the implementation of your school's one-to-one initiative?
22. Is there anything else you would like to share about how your principal has led, supported and influenced the implementation of your school's one-to-one initiative?

Appendix E

Observation Protocol

Date of Observation: _____

Duration of Observation: _____

Primary Participant Observed: _____

Secondary Participants Observed: _____

Describe an overview of the particular activity being observed:

_____

_____

_____

_____

"Leadership Look Fors" in the Observation (As based on Literature Review Findings):

During the observation the observer will use the following abbreviations to signify when an observation note focuses on a particular principal role in leading instructional technology:

LTV=Leader of Technology Vision

DE=Digital Expert

MR=Manager of Resources

MTU=Model of Technology Use

TS=Technology Supporter

LC=Leader of Change

ET=Evaluator of Technology

ES=Encourager & Supporter

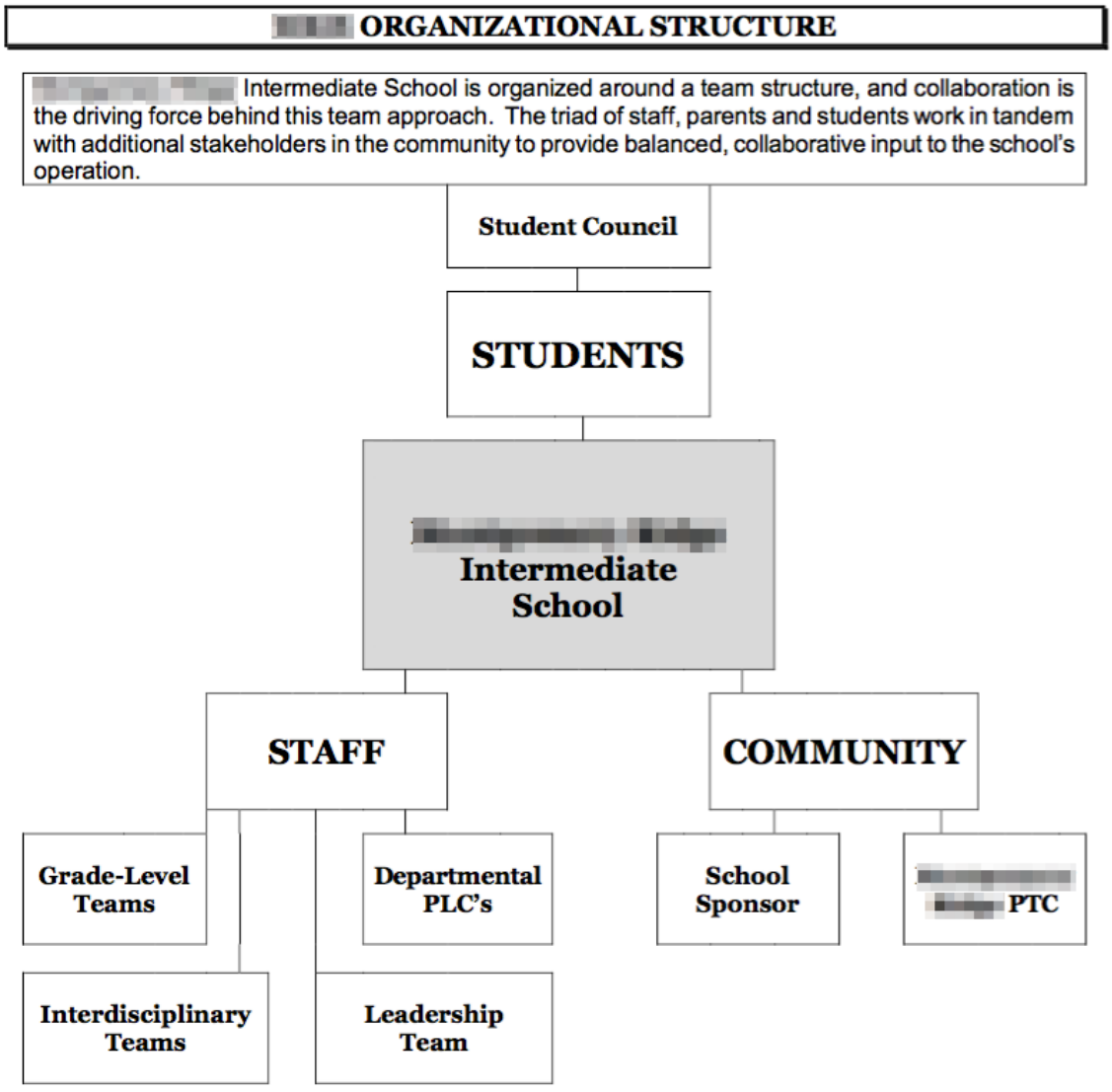
FCE=Family & Community Engager

LET=Leader of Ethics in Technology

Notes will be taken electronically by the observer and will include descriptions, quotations, and observer comments. The observer will use these abbreviations during the observation and after the observation when reflecting on the notes that were collected.

Appendix F

Endor Intermediate School Organizational Structure



Appendix G

Endor Layers of Support Document

[redacted] Layers of Support 2015-2016

1. [redacted] Reinforcement (device)
   - Hours of Availability: All Day
   - Student workers in each HR class who will have training on minimal device support/troubleshooting skills
2. HelpDesk (device)
   - Hours of "walk-up" availability: Open 7:00am (teachers) or 7:15am (students) through 7:35am, then submit tickets
   - [redacted] (device) 7:00am-1:00pm and [redacted] (instructional and device) 1:30pm-2:40pm
3. Building Level TC (instructional and device)
   - Hours of Availability: All Day (Scheduled to meet with specific departments on a rotating schedule for instructional support).
   - Primarily focused on intersection of technology with pedagogy and content. Available to assist with creating lessons, co-teaching, and resource identification and management.
   - Available for technical support and as a liaison to district level support for ticket referral
4. FreshDesk Ticketing System (device)
   - Hours of Availability: All Day
   - Email [redacted]
5. Early Adopters (instructional and device)
   - Hours of Availability: Plan period and before/after school
   - Logistical and basic technical support for teachers adopted by each Early Adopter
   - Instructional support including identification of resources and ideas for creating overlap between pedagogy and content with technology
6. Digital Conversion Support Team (instructional and device)
   - Hours of Availability: Plan period and before/after school
   - Logistical and basic technical support for teachers at each grade level and within the ENCORE group
   - Instructional support including identification of resources and ideas for creating overlap between pedagogy and content with technology
7. Building Level "Experts" (instructional)
   - Hours of Availability: Plan period and before/after school
   - Instructional Support based on their area of expertise (List provided of teachers and areas of expertise)

Appendix H

Endor Instructional Support Meeting Agenda

[redacted] Grade Level Instructional Support

[redacted] will meet regularly with grade levels to focus on instructional support. Agenda items of these grade level plan period meetings are

1. Early Adopters share app/website/program
2. [redacted] share app/website/program
3. Interested teachers will communicate interest in trying our shared app/website/program with specific standard/lesson
4. [redacted] will work with teachers to develop a lesson incorporating app/website/program

7th Grade
Tuesday, August 11 – meet 1st Period
August 17-21 – 7th Grade Lessons

6th Grade
Tuesday, August 18 – meet 3rd Period
August 24 – August 28 – 6th Grade Lessons

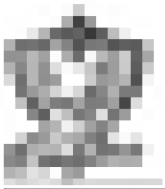
5th Grade
Tuesday, August 25 – meet 6th Period
August 31- September 4 – 5th Grade Lessons

4th Grade
Tuesday, September 1 – meet 4th Period
September 8-14 – 4th Grade Lessons

Between September 15-September 29, this process will be evaluated for effectiveness and adjusted as needed after fall break.

Appendix I

Endor Mission, Beliefs, Vision Handbook Page



SCHOOL MISSION

"Creating challenging and meaningful learning experiences for every student while building strong, positive relationships."

BELIEFS

This We Believe…

Students will…

- Have positive, trusting relationships with adults in the school.
- Be active participants in their learning.
- Be challenged to reach their full potential through engaging in meaningful, higher order learning experiences.
- Be good stewards of their opportunities, experiences and resources.
- Learn lifeskills that will enable them to be successful in school and life.

Teachers will…

- Connect with individual students.
- Provide a developmentally appropriate education through enrichment, remediation, and mentoring.
- Use a variety of research-based instructional strategies, activities, and assessments.
- Offer a rigorous, relevant, integrated, and exploratory curriculum.
- Model lifelong learning and hold high expectations for all students.
- Nurture each student's physical, social, emotional, and intellectual needs in a safe and caring environment.

Stakeholders (School Staff, Students, Parents, and Community) will…

- Respect and celebrate cultural diversity and individuality.
- Work together for student success through collaboration, problem solving, open communication and partnerships.

VISION

The Intermediate School Vision is a simple statement of the type of school we wish to see. In some aspects it is a reflection of what we have already achieved; in others it is a statement of how we would like to develop . Overall, it is the common aim for everything we do from preparing lessons, to working with the children, to recruiting new staff, to improving our facilities.

At Intermediate School we:

- **V**ow to engage the whole child;
- **I**mplement a program of excellence and celebrate our achievements;
- **S**et our sights on the future to prepare our students;
- **I**nspire our faculty, staff and students to build strong relationships;
- **O**pen our doors to create a safe and welcoming environment;
- **N**urture intrinsic learning in every child.

PERSONAL AND TEAM EXPECTATIONS

The philosophy of Intermediate School is that each student is a valuable member of our team. Our expectations are the result of a concerted effort to understand the developmental characteristics of the students we serve and an acknowledgment that all students can be successful. With this in mind our students and staff function with a set of expectations that lead from effort to success. In between are a set of commitments that define how we co-exist, treat one another, and fly like

Appendix J

Endor Principal Budget Request 2015-2016

Lake District Schools
Principal Budget Requests
2015-2016

School Name: _____

Please submit to the Director of Schools by Friday, March 6, 2015

TCA §49-2-303(b)(9) provides

(b) It is the duty of the principal to:

(9) Prepare, annually, a budget request for the school under the principal's care and submit the budget request to the director of schools...

- Instructional Materials & Supplies including digital resources
  - iPad App Fund – Establish an App Fund for teachers in 4th (possibly 5th) grade(s) to help offset the initial set-up cost ($200/teacher) – $2000 (possibly $3600)
  - Accelerated Math - $1000 – Continued in Math Intervention
- Technology
  - Help Desk – Eliminate Contract with PCS for Technical Support Services. Utilize hours saved for 5 hour TA to run desk.
  - Promethean Board – Room 221 - $1898
- Building, Grounds, and Maintenance
  - Broken student chair replacement cycle (year 3 of 4 year plan) - Est. 350 chairs @$25/each = $8,750
  - Concrete bus pick-up/drop-off areas (est. 8 yards of concrete) - $2,500 (Adventure Club Funds)
  - VCT Tile Replacement - Continue office VCT tile replacement to extend through office hallway and behind office reception work space (approx. 1000 sq./ft.) - $1000
  - Testing Center Set-Up for Student Services - $5000 (Adventure Club)
  - Adventure Club Office Space - $4250 (Adventure Club)
  - Replace Main Office and Student Services Carpeting - $1350 ($2850 w/SS) – (Adventure Club)
  - Split Room 125 to create 2 RTI classrooms - $4360 ($5750 w/door) – (Adventure Club)
  - Convert 221/118 to Academic Success Classrooms - $500 (Adventure Club)
  - Help Desk Set-up - $1000 (Adventure Club)

- Training & Staff Development
    - Team Leader Retreat – Conduct annual kick-off meeting. Focus on schedules, programming, students, and staff decision-making. - $250
    - PLC Leader Retreat – Conduct an annual PLC Leaders retreat. Focus is to expand their repertoire of skills and provide them with experience using new protocols. In addition, PLC Leaders will offer input to Professional Development needs for their specific departments - $500
    - Common Core Implementation Training – Compensation for Core Area teachers for state-level training provided during the Summer of 2014. (12 teachers, potential @ $75/day plus trade-out) - Est. $900
    - Digital Conversion Conferences/Training for iPad and Laptop Users – Est. $5000 (Adventure Club Funds)

- Other
    - Morning/Afternoon Intervention: Utilize core area classroom teachers to provide intervention programming for students at each grade level. (Adventure Club Funds)
    - Strategic Compensation: Common Assessment Team (CAT) Leaders (1/subject/grade level = 7 teachers @ $500 ea.) $3,500; PLC Leaders (2/per Math/ELA + 1/Encore, Science, and SS @ $250 ea.) $1,750; Digital Conversion Team (1/grade level +1 Encore/SPED = 5 teachers @ $500 ea.) $2500.
    - Eliminate Technology Teaching Position – Addition of 20 hours. 4 hr. tech teaching TA position, 1- 4 hr. TA position and 1- 4.5 hr. TA position for RTI/Academic Success. Additional 6 hours for reduction purposes.
    - Eliminate 1 full-time SPED TA position, create 2- 4 hr. TA positions and save 3.5 hours of salary cost.

_____ _____

Principal's Signature Date

Appendix K

Endor Early Adopters End of Year Meeting Agenda 2014-2015

Welcome and Thank You

Layers of Support (see table attached)

Student iReach Reinforcements (1 from each homeroom)
(Proposal approved by Early Adopters)
*rec from previous grade made during inservice week based on homeroom rosters (and 4th grade from SH and FH TCs)
*train 1st day of school during grade level's encore time or time that works with day 1 schedule

Amidala's Instructional Support Conversation
*concerned raised that this type of conversation could create undue stress on non-early adopters
*Amidala will meet with grade levels during plan (once per month on average)
*Grade level conversations kicked off with an early adopter sharing then Amidala sharing a program/app/instructional strategy with the focus on "who would like to work with Amidala and/or _____ on this next week(s)"
*PLC Focus (Amidala attend PLC upon request)
*Please send Amidala and more ideas/suggestions on how she can best support iReach instruction

Label of Devices
Agreed – labels will be pre-printed and should be a part of HR 1st day(s) procedures

Day Users
This group agrees best plan is to house choice day user laptops on team (note that district may direct this and we may have to route through helpdesk – this info came after this meeting)

Procedures for not charged or device left at home
DECISIONS NEEDED

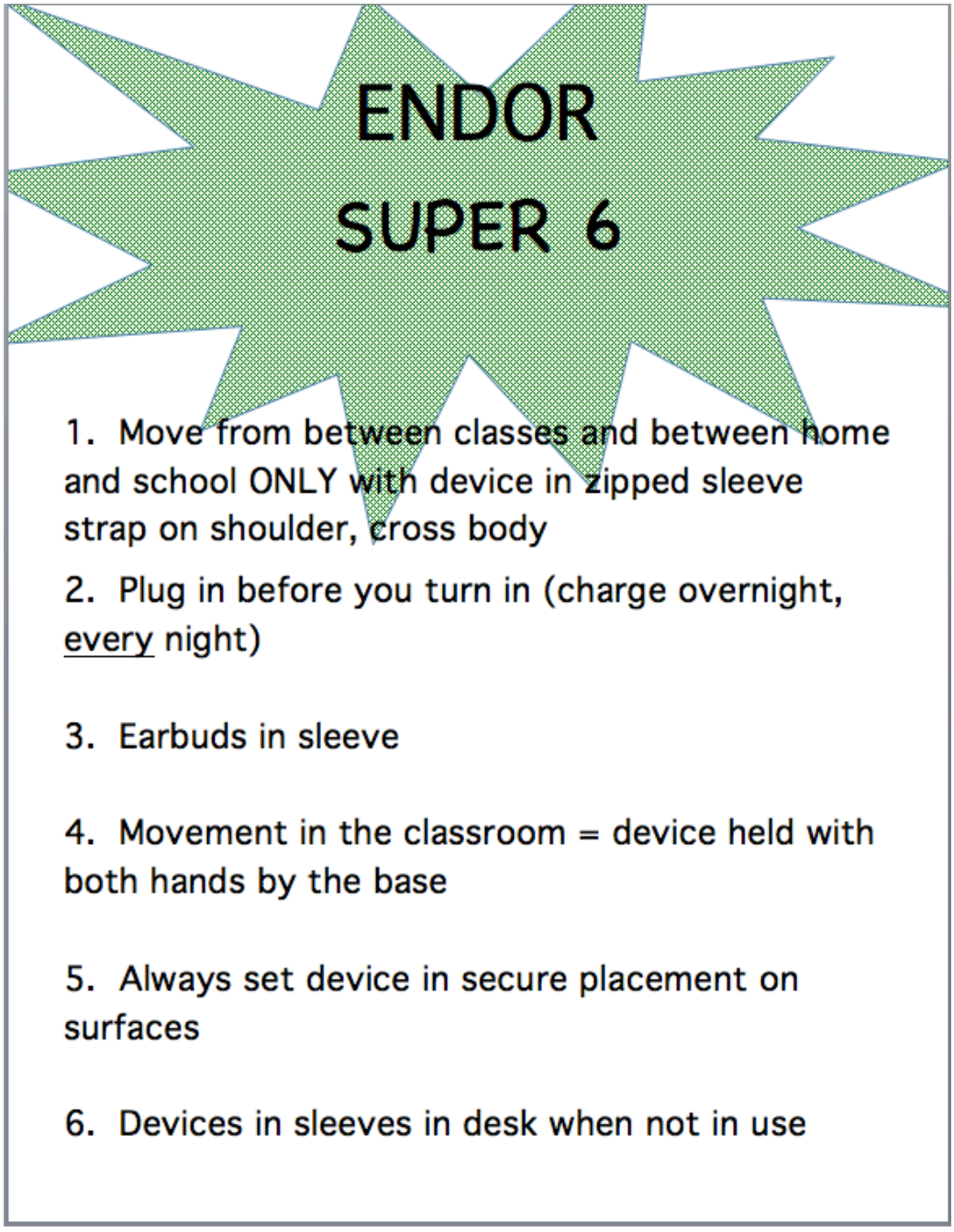
- Make it to lunch without charging or getting a battery, no think sheet?
- If student has to charge or request a battery prior to lunch – they get a think sheet either from teacher (if plug in) or helpdesk (if get battery)? OR they have to leave at school that night?
- Team leader keep track of Think Sheets (email from helpdesk)?
- 3rd think sheet – detention?
- Different color think sheet for tech issues suggestion

- Kids who leave device at home – must go through day without device – how many times before they lose privilege to take home?

Non-Negotiables – need to finalize…wordsmith…and better name?
1. Move from class to class ONLY with device in zipped sleeve strap cross body
2. Plug in before you turn in (charge overnight, every night)
3. Earbuds in sleeve
4. Movement in the classroom = device held with both hands
5. Always set device in secure placement on surfaces
6. Devices in sleeves in desk when not in use

Appendix L

Endor Super Six for the One-to-One Initiative



Appendix M

Endor First Semester Staff Bingo Game Card

B *Branching*	I *Into*	N *New*	G *Growth*	O *Opportunities*
Send an encouraging note to another staff member at [redacted]	Volunteer to read to a group of students (not your own)!	Volunteer a morning to present the morning announcements to [redacted]	Volunteer to run with the running club!	Volunteer a day to assist students during homework help after school!
Volunteer to drop off another teacher's class to lunch, encore, etc!	Make 3 positive phone calls to parents about their students!	Attend a school board meeting!	Volunteer a morning to walk in the gym with the 6th & 7th grade students!	Volunteer to help in the library for 30 min!
Take a group of students on trash detail during recess!	Volunteer a morning to eat breakfast in the cafeteria with the 4th & 5th grade students!	[redacted]	Visit and Encore class to play a game, view artwork, see STEM in action, or hear music!	Share a resource with your grade level department at [redacted]
Play a game or walk the track with students during recess!	Send an email to [redacted] inviting teachers to view a lesson in your class!	Attend either a Band, Orchestra, or Chorus evening concert!	Attend a [redacted] home basketball game and cheer on the [redacted]	Like the [redacted] Facebook page, or share something with [redacted] to be posted on our [redacted] Facebook page!
Send an encouraging note to a student at [redacted]	Offer an opportunity for a parent to volunteer in your class!	Attend the Staff Holiday Party!	Provide a yummy dish for a staff luncheon!	Give students an opportunity to complete an act of kindness!

Bingo of 5 in a row (horizontal, vertical or diagonal) = 1 extra jeans day per week during the 3rd 9-weeks and entered into the drawing for prizes! Blackout Bingo (the whole card) = 1 extra jeans day per week during the 3rd 9-weeks and earn 5 entries into the drawing for prizes and a group lunch off campus!

Appendix N

Endor Teaching Interview Process Document

Teaching Position Interview Process

The interview process may not be like any other that you have experienced during your employment career. However, we believe it allows our staff the best opportunity to gauge the level of commitment and professionalism of each candidate while demonstrating our desire to find the most qualified candidate to help us continue our rich tradition. Following is a summary of the interview process.

The Process

After a brief introduction to the committee, the candidate will be expected to address, through a presentation, the topics listed below. The maximum time limit for the presentation is 30 minutes.

I. Content Knowledge
- A. Planning
- B. Grade level standards
- C. Horizontal/Vertical Alignment
- D. Assessment
  - a. Pre/Post Assessment
  - b. Assessment Tools
  - c. Student Ownership/Goal Setting
  - d. Data Analysis to Inform Instruction
- E. Scope/Sequence/Pacing

II. Pedagogical Knowledge
- A. Teaching strategies related to state standards
- B. Classroom organization
- C. Differentiation

III. Technological Knowledge
- A. Instructional technology for students
- B. Technology resources for teachers
- C. Prior training and experience

IV. Professional Relationships/Development
- A. Building and maintaining strong relationships with stakeholders (parents and colleagues)
- B. Current level of high quality professional development trainings attended
- C. TPACK Self-Assessment (http://www.matt-koehler.com/tpack/tpack-explained/) (https://www.youtube.com/watch?v=EmRw_wARuMk)
- D. Experience with Teacher Evaluation Models ([redacted] currently utilizes TIGER)

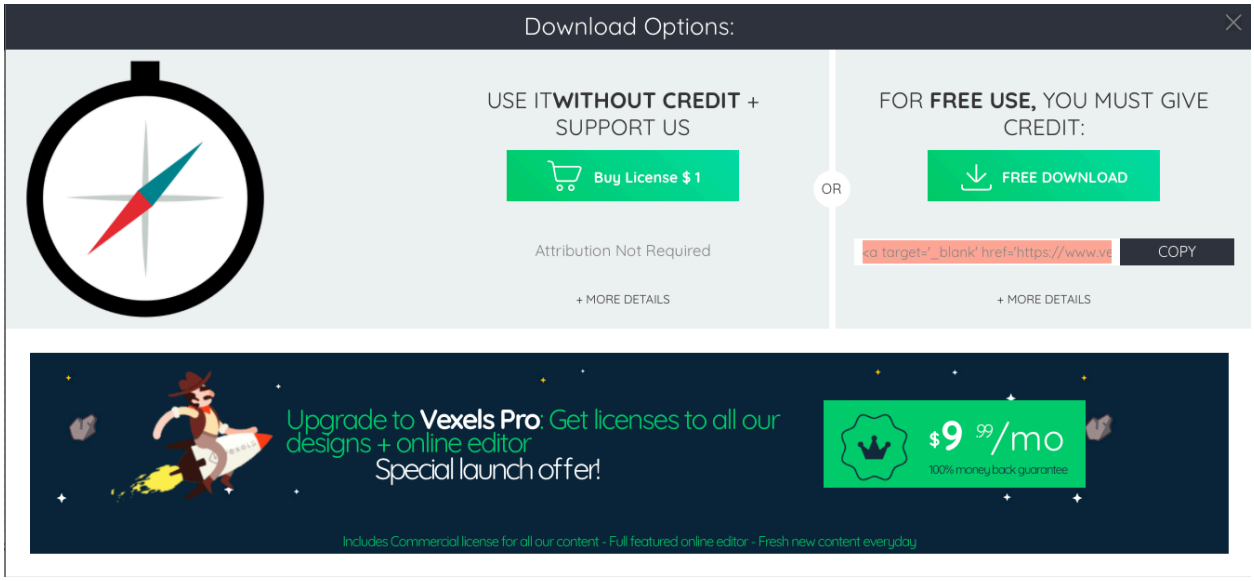
On the day of the interview, the candidate will receive a written scenario and be expected to address the concerns presented.

In conclusion: The candidate will respond to questions from the interview panel and have the opportunity to ask questions of the team.

REMINDERS and ADDITIONAL INFORMATION: The interview should last approximately 1 hour (maximum). Use of data to support your answers where appropriate is expected. Sample data will be provided to interview participants.

Appendix O

Proof of Purchase and Permission to Use Compass Graphic Without Credit



PayPal

Mar 12, 2017 13:33:17 PDT
Transaction ID: 18700069PP476021L

Hello Casey Cutter,

You sent a payment of $1.00 USD to vexels (info@vexels.com)

It may take a few moments for this transaction to appear in your account.

Merchant
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info@vexels.com
+598 59899102345

Instructions to merchant
You haven't entered any instructions.

Check out with PayPal and choose PayPal Credit to enjoy No Payments + No Interest if paid in full in 6 months on purchases of $99 or more.

Apply Now

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Description	Unit price	Qty	Amount
Compass flat icon License Item# 135725	$1.00 USD	1	$1.00 USD

Subtotal	$1.00 USD
Total	$1.00 USD
Payment	$1.00 USD

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VITA

Casey Michael Cutter was born in Little Rock, Arkansas and resides in Knoxville, Tennessee. He earned his Bachelor of Science degree in Business Administration in 2003 from the University of Colorado at Boulder. After spending time working in the business world for Kroenke Sports Enterprises and Hewlett Packard, he later decided to go back to school to pursue his passion for teaching. He attended Regis University and graduated with a Master degree in Education and Licensure with an emphasis in Elementary Education in 2007. He taught fourth grade in Colorado Springs, Colorado before moving to Knoxville, Tennessee in 2009. He taught third grade at Adrian Burnett Elementary School and fourth grade at Ball Camp Elementary School before being accepted as a fellow in Knox County School's prestigious Leadership Academy in 2012. The Leadership Academy is a partnership between Knox County Schools and the University of Tennessee and the academy prepares candidates to become outstanding new school principals through a full-time, intensive 15-month fellowship program. During his time as a Leadership Academy fellow, Casey was the assistant principal at Copper Ridge Elementary School. Upon graduation from the Leadership Academy in 2013, he was named the assistant principal at Norwood Elementary School. During his first year as an assistant principal at Norwood Elementary School, Casey helped lead and implement a one-to-one initiative at the school. In 2017, Casey completed his Doctor of Philosophy degree in Education with a concentration in Leadership Studies in Education from the University of Tennessee.